

THE ECHINODERM NEWSLETTER

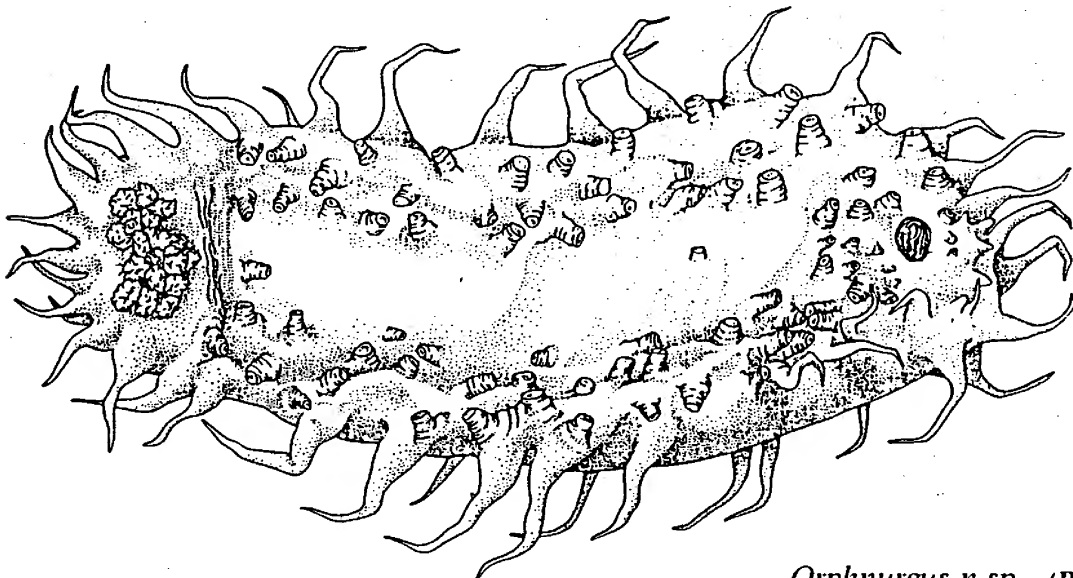
Number 19. 1994

Editor: Cynthia Ahearn
Smithsonian Institution
National Museum of Natural History
Room W-318, Mail Stop 163
Washington D.C. 20560, U.S.A.

Distributed by: David Pawson
Smithsonian Institution
National Museum of Natural History
Room W-323, Mail Stop 163
Washington D.C. 20560, U.S.A.

The newsletter contains information concerning meetings and conferences, publications of interest to echinoderm biologists, titles of theses on echinoderms, and research interests, and addresses of echinoderm biologists. Individuals who desire to receive the newsletter should send their name, address and research interests to the editor.

The newsletter is not intended to be a part of the scientific literature and should not be cited, abstracted, or reprinted as a published document.



Orphnurgus n.sp. (P. Condit del.)

TABLE OF CONTENTS

Echinoderm Specialists	
Addresses.....	1
Telephone - FAX - e-mail numbers.....	25
Current Research.....	32
Requests and Information.....	44
Recent Publications on Echinoderms.....	48
Fossil Crinoid Collections at the	
National Museum of Natural History, Smithsonian.....	67
Papers Presented at Meetings	
8th International Echinoderm Conference.....	68
XII Congreso Nacional de Zoologia.....	70
American Society of Zoologists.....	71
Zoological Society of Japan.....	72
Geological Society of America.....	76
Papers Presented at Meetings (by region)	
Canada.....	79
Europe.....	80
Mexico.....	81
South America.....	81
India.....	81
New Zealand.....	82
New Caledonia.....	82
Japan.....	82
South Africa.....	82
United States.....	83
Theses and Dissertations.....	84
How I began to study echinoderms (part 4)	
A.L. Feldman, C.G. Messing, D. Zavodnik.....	90
Books and Announcements.....	92
Echinoderms of the Rovinj area.....	117
Obituary: Howard Barraclough Fell.....	119

ADAMS, NIKKI
UNIVERSITY OF MAINE
DEPARTMENT OF ZOOLOGY
5751 MURRAY HALL, ROOM 100
ORONO, ME 04469

AGATSUMA, YUKIO
HOKKAIDO CENTRAL FISHERIES
EXPERIMENTAL STATION
HAMANAKA 238
YOICHI HOKKAIDO, JAPAN

AHEARN, CYNTHIA
SMITHSONIAN INSTITUTION
NAT. MUSEUM OF NATURAL HISTORY
ROOM W318, MAIL STOP 163
WASHINGTON, DC 20560

ALBI, YVONNE
P.O. BOX 45828
LOS ANGELES, CA 90045

ALBUQUERQUE, MARIA
UNIVERSIDAD SANTA URSULA
DEPT DE CIENCIAS BIOLOGICA
RUA F. FERRARI, 75 BOTAFOL
RIO DE JANEIRO, BRAZIL

ALI, MOHAMED SAID M.
EL MINIA UNIVERISTY
DEPARTMENT OF GEOLOGY
FACULTY OF SCIENCE
EL MINIA, EGYPT

ALLEN, JOHN A.
UNIVERSITY MARINE BIOLOGICAL STATION
MILLPORT
ISLE OF CUMBRAE, SCOTLAND, U.K

ALVA, VICTOR
UNIVERSITE LIBRE DE BRUXELLES
BIOLOGIE MARINE (CP.160)
50, AV.F.D. ROOSEVELT
BRUXELLES, BELGIUM

ALVAREZ, LEONARDO R.
COLORADO #79
NAPLES
MEXICO D.F. 03810, MEXICO

ALVAREZ, MARTINEZ DE
UNIVERSIDAD DE LA LAGUNA
DEPARTAMENTO DE ZOOLOGIA
TENERIFE, CANARY ISLANDS

AMEZIANE-COMINARDI, NADIA
MUSEUM NATIONAL D'HISTOIRE NATURELLE
BIOLOGIE INVERTEBRES MARINS
55, RUE DE BUFFON
PARIS. 75005 FRANCE

ANDACHT, TRACY M.
DUKE UNIVERSITY MARINE LABORATORY
PIVERS ISLAND
BEAUFORT, NC 28516-9721

ANDERSON, EDWIN J.
TEMPLE UNIVERSITY
GEOLOGY DEPARTMENT
PHILADELPHIA, PA 19122

ANDERSON, JOHN M.
110 ROAT ST.
ITHACA, NY 14850

ANDERSON, ROLAND
PUGET SOUND BIOLOGIST
THE SEATTLE AQUARIUM
PIER 59
SEATTLE, WA 98101

ANDRADE, HECTOR
UNIVERSIDAD DE VALPARAISO
INSTITUTO DE OCEANOLOGIA
CASILLA 13-D
VINA DEL MAR, CHILE

ARANGUIZ, CHITA B.G.
UNIVERSIDAD CATOLICA DEL NORTE
DEPARTAMENTO BIOLOGIA MARINA
CASILLA 117
COQUIMBO, CHILE

ARENDT, YURII A.
PALEONTOLOGICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES
PROFSOYUSNAYA STR. 123
117647 MOSCOW, RUSSIA

ARISOLA, AMELIA T.
SEAFDEC AQUACULTURE DEPT
P.O. BOX 256
ILOILO CITY, PHILIPPINES

ARNAUD, PATRICK M.
CENTRE D'OCEANOLOGIE DE MARSEILLE
STATION MARINE D'ENDOUME
MARSEILLE, 13007 FRANCE

ARONSON, RICHARD B.
DAUPHIN ISLAND SEA LAB
MAR ENVIRON SCI CONSORTIUM
P.O. BOX 369-370
DAUPHIN ISLAND, AL 36528

ARTECHE, INAKI
DEPARTAMENTO DE BIOLOGIA (ZOOLOGY)
FACULTAD DE CIENCIAS
APARTADO 644
BALBOA, SPAIN

AUSICH, WILLIAM L.
THE OHIO STATE UNIVERSITY
DEPARTMENT OF GEOLOGICAL SCIENCES
155 SOUTH OVAL MALL
COLUMBUS, OH 43210-1398

AUSTIN, WILLIAM
KHOYATAN MARINE LABORATORY
4635 ALDER GLEN ROAD
RR1, COWICHAN BAY
BRITISH COLUMBIA, VOR 1N0 CANADA

BAKER, ALAN
NATIONAL MUSEUM OF NEW ZEALAND
TE PAPA TONGAREWA
PO BOX 467
WELLINGTON, NEW ZEALAND

BALKEMA, A. A.
LISPLEIN 11
PO BOX 1675
ROTTERDAM, NL 3000BR THE NETHERLANDS

BALL, BRENDAN JOHN
UNIVERSITY COLLEGE GALWAY
MARTIN RYAN MARINE SCIENCE INSTITUTE
ZOOLOGY DEPARTMENT
GALWAY, IRELAND

BALSER, ELIZABETH J.
SMITHSONIAN MARINE STATION
AT LINK PORT
5612 OLD DIXIE HIGHWAY
FT. PIERCE, FL 34946

BARKER, MICHAEL
PORTOBELLO MARINE LABORATORY
PO BOX 8
PORTOBELLO
DUNEDIN, NEW ZEALAND

BARTSCH, ILSE
BIOLOGISCHE ANSTALT HELGOLAND
NOTKESTR. 31
HAMBURG 22607, GERMANY

BASCH, LARRY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ
INSTITUTE OF MARINE SCIENCES
272 APPLIED SCIENCES
SANTA CRUZ, CA 95064

BASKAR, B. K.
CENTRAL MARINE FISHERIES R.I.
E.R.G. ROAD
ERNACULAM
COCHIN, 682031 INDIA

BAUMILLER, TOMASZ K.
HARVARD UNIVERSITY
DEPT EARTH & PLANETARY SCI
20 OXFORD STREET
CAMBRIDGE, MA 02138

BAY-SCHMITH, ENRIQUE
INSTITUTO DE BIOLOGIA CELULAR
UNIVERSIDAD DE CONCEPCION
CONCEPCION, CHILE

BAZHIN, ALEXANDER
18 NABEREZHNYAYA
KAMCHATNIRO
PETROPVLOVSK-KAMCHATSKY, 68302 RUSSIA

BEAVER, HAROLD
BAYLOR UNIVERSITY
DEPARTMENT OF GEOLOGY
WACO, TX 76798

BECKER, J.
MUSEU NACIONAL
QUINTA DA BOA VISTA
RIO DE JANEIRO, RJ, 20940-040 BRAZIL

BEGBIE, KIRSTEN M.
GATTY MARINE LAB
EAST SANDS
ST ANDREWS, SCOTLAND, U.K.

BELL, BRUCE M.
POST OAK OIL COMPANY
SUITE 333W
2601 NW EXPRESSWAY
OKLAHOMA CITY, OK 73112

BELIAEV, GEORGE M.
P.P. SHIRSHOV INSTITUTE OF OCEANOLOGY
KRASIKOVA STR. 23
MOSCOW, 117218 RUSSIA

BENTLEY, ANDREW
UNIVERSITY OF PORT ELIZABETH
DEPARTMENT OF ZOOLOGY
PO BOX 1600
PORT ELIZABETH, 6000, SOUTH AFRICA

BERENTS, PENELOPE B.
THE AUSTRALIAN MUSEUM
INVERTEBRATE ZOOLOGY
COLLEGE STREET
SYDNEY, NSW, AUSTRALIA

BERGER, JACQUES
UNIVERSITY OF TORONTO
DEPARTMENT OF ZOOLOGY
TORONTO, ONTARIO, M5S 1A1 CANADA

BILLETT, DAVID
INSTITUTE OCEANOGRAPHIC SCIENCE
DEACON LABORATORY, BROOK ROAD
WORMLEY, GODALMING
SURREY, GU8 5UB ENGLAND, U.K.

BIRENHEIDE, RUDIGER
TOKYO INSTITUTE OF TECHNOLOGY
C/O TATSUO MOTOKAWA: BIOL. LAB
O-OKAYAMA, MEGURO-KU
TOKYO 152, JAPAN

BIRKELAND, CHARLES E.
UNIVERSITY OF GUAM STATION
MARINE LABORATORY
MANGILAO, GUAM 96923

BIRTLES, ALASTAIR
JAMES COOK UNIVERSITY N. QUEENSLAND
SCHOOL OF BIOLOGICAL SCIENCES
MARINE BIOLOGY DEPARTMENT
TOWNSVILLE, QD 4811, AUSTRALIA

BIRYUKOVA, INGA V.
PACIFIC RESEARCH INSTITUTE OF
FISHERIES OCEANOGR., LABORATORY
PHYSIOLOGY, 14 SHEVCHENKO ALLEY
VLADIVOSTOK, 690600 RUSSIA

BLACK, W. ROBERT
THE UNIVERSITY OF WESTERN AUSTRALIA
DEPARTMENT OF ZOOLOGY
NEDLANDS, W.A., 6009 AUSTRALIA

BLAKE, DANIEL B.
UNIVERSITY OF ILLINOIS
DEPT OF GEOLOGY 245 NHB
1301 W. GREEN ST.
URBANA, IL 61801

BOCKELIE, JOHAN F.
NORSK HYDRO EXPLORATION
P.O. BOX 200
N-1321 STABEKK, NORWAY

BOCZAROWSKI, ANDRZEJ
SILESIAN UNIVERSITY
DEPARTMENT OF EARTH SCIENCES
BEDZINSKA STR. 60
SOSNOWIEC 41-200, POLAND

BOOTH JR., BILLY B.
MOTE MARINE LABORATORY
1600 CITY ISLAND PARK
SARASOTA, FL 33577

BORZONE, CARLOS A.
UNIVERSIDADE FEDERALE PARANA
CENTRO DE ESTUDOS DO MAR
AV BEIRA MAR, s/n. PONTAL DO SUL
PARANAGUA, PARANA, 83255-000 BRAZIL

BOSCH, ISIDRO
STATE UNIVERSITY OF NEW YORK
DEPARTMENT OF BIOLOGY
GENESEO, NY 14454

BOTTJER, DAVID
UNIVERSITY OF SOUTHERN CALIFORNIA
DEPT. OF GEOLOGICAL SCIENCES
LOS ANGELES, CA 90089

BOUDOURESQUE, CHARLES F.
LABORATOIRE D'ECOL DU BENTHOS
FACULTE DES SCIENCES DE LUMINY
MARSEILLE CEDEX 9, 13288 FRANCE

BOUGOIN, ALLAIN
CENTRE UNIVER. DE SHIPPGAN
UNIVERSITE DE MONCTON
SHIPPGAN, NEW BRUNSWICK, E0B 2P0 CANADA

BOULAND, CATHERINE
UNIVERSITE LAVAL
DEPARTEMENT DE BIOLOGIE
QUEBEC, QC, G1K 7P4 CANADA

BRANDT, DANITA
EASTERN MICHIGAN UNIVERSITY
DEPT. OF GEOGRAPHY & GEOLOGY
YPSILANTI, MI 48197

BRAY, RICHARD
176 WEST MAIN ST.
PORT JERVIS, NY 12771

BRETON, GERARD
MUSEUM D'HISTOIRE NATURELLE
PLACE DU VIEUX MARCHE
LE HAVRE, CEDEX, 76600 FRANCE

BRETT, CARLETON
UNIVERSITY OF ROCHESTER
DEPT. OF GEOLOGICAL SCIENCES
ROCHESTER, NY 14627

BREWIN, PAUL E.
UNIVERSITY OF OTAGO
DEPT. OF MARINE SCIENCE
P.O. BOX 56
DUNEDIN, NEW ZEALAND

BRITO, IGNACIO M.
INSTITUTO AMBIENTAL DO PARANA
RUA DESEMBARGADOR MOTTA, 3384
CURITIBA, PR, 80420-200 BRAZIL

BROADHEAD, THOMAS
UNIVERSITY OF TENNESSEE
DEPT. OF GEOLOGICAL SCIENCE
KNOXVILLE, TN 37996

BROWER, JAMES
SYRACUSE UNIVERSITY
DEPARTMENT OF GEOLOGY
HEROY GEOLOGY LABORATORY
SYRACUSE, NY 13244-1070

BRUMBAUGH, JOE
SONOMA STATE UNIVERSITY
DEPT. OF BIOLOGY
ROHNERT PARK, CA 94928

BUITRON-SANCHEZ, BLANCA E.
INSTITUTO DE GEOLOGIA, UNAM
CIUDAD UNIVERSITARIA
DELEG. COYOACAN
04510 MEXICO, D.F., MEXICO

BURKE, ROBERT
UNIVERSITY OF VICTORIA
DEPARTMENT OF BIOLOGY
VICTORIA, B.C. V8W 2F2, CANADA

BURTON, MARGARET
MEMORIAL UNIVERSITY OF NEWFLD.
DEPARTMENT OF BIOLOGY
ST JOHN'S, NEWFOUNDLAND A1B, CANADA

BUSSARAWIT, SOMCHAI
PHUKET MARINE BIOLOGICAL CENTR
PO BOX 60
PHUKET 83000, THAILAND

BUSTOS, EDUARDO
INSTITUTO DE FOMENTO PESQUERO
AVE. DIEGO PORTALES 1450
PUERTO MONTT, CHILE

BYERS, SHEILA
ROYAL ONTARIO MUSEUM
DEPT. OF INVERT. ZOOL.
100 QUEEN'S PARK
TORONTO, ONTARIO, M5S 2C6 CANADA

BYRNE, MARIA
UNIVERSITY OF SYDNEY
DEPT EMBRYOLOGY AND HISTOLOGY
SYDNEY N.S.W. 2006, AUSTRALIA

CAFFI, MARGARITA G.
UNIVERSIDADE DE CONCEPCION
DEPTO DE ZOOLOGIA
CASILLA 1367
CONCEPCION, CHILE

CALDWELL, JOHN W.
UNIVERSITY OF FLORIDA
DEPT ENVIRON ENGINEERING SCI
111 BLACK HALL
GAINESVILLE, FL 32611

CAMARGO, TANIA MARIA
UNIVERSIDADE DE SAO PAULO
INSTITUTO OCEANOGRAPHICO
SAO PAULO, BRAZIL

CAMERON, R. ANDREW
CALIFORNIA INSTITUTE OF TECH
DIVISION OF BIOLOGY 156-29
PASADENA, CA 91125

CAMPBELL, ANDREW
QUEEN MARY & WESTFIELD COLLEGE
SCHOOL OF BIOLOGICAL SCIENCES
UNIVERSITY LONDON, MILE END RD
LONDON E1 4NS, ENGLAND

CAMPBELL, DAVID B.
RIDER COLLEGE
BIOLOGY DEPARTMENT
2083 LAWRENCEVILLE ROAD
LAWRENCEVILLE, NJ 08648-3099

CANDIA-CARNEVALI, M. DANIELA
UNIV. DEGLI STUDI DI MILANO
DIPARTIMENTO DI BIOLOGIA
VIA CELORIA 26
20133 MILANO, ITALY

CANNON, L.R.G.
QUEENSLAND MUSEUM
P.O. BOX 3300
SOUTH BRISBANE, QUEENSLAND, AUSTRALIA

CARCAMO, ALFONSO G.
UNIVERSIDAD DE CHILE-OSORNO
CASILLA 933
OSORNO, CHILE

CARDER, NANCY
6503 LA PALOMA CT.
CARLSBAD, CA 92009

CAREY JR, ANDREW G.
OREGON STATE UNIVERSITY
SCHOOL OF OCEANOGRAPHY
CORVALLIS, OR 97331

CARNEY, ROBERT
LOUISIANA STATE UNIVERSITY
COASTAL RESOURCES LABORATORY
BATON ROUGE, LA 70803

CARPENTER, ROBERT C.
CALIFORNIA STATE UNIVERSITY
DEPT. OF BIOLOGY
NORTHRIDGE, CA 91330

CARSON, SALLY
PORTOBELLO MARINE LABORATORY
P.O. BOX 8
PORTOBELLO, DUNEDIN, NEW ZEALAND

CASTILLO, JUAN CARLOS
ECOLOGIA MARINA
FAC. C BIOLOGICAS, UNIVERSIDAD
CATOLICA, CASILLA 114-D
SANTIAGO, CHILE

CASTRO, LILY ROMINA
C/O CICESE
P.O. BOX 434843
SAN DIEGO, CA 92143

CASTRO MANSO, CYNTHIA LARA DE
DEPARTAMENTO DE ZOOLOGIA
UNIVERSIDAD PARANA, CX-P 19-020
81.504 CENTRO POLITECNICO
CURITIBA-PARANA, BRAZIL

CHAET, A.B.
UNIVERSITY OF WEST FLORIDA
DEPT. OF CELL AND MOLEC. BIOL.
PENSACOLA, FL 32514

CHEN, CHANG-PO
INSTITUTE OF ZOOLOGY
ACADEMIA SINICA
NANKAN, TAIPEH
TAIWAN, 11529, REPUB. OF CHINA

CHIA, FU-SHIANG
UNIVERSITY OF ALBERTA
DEPARTMENT OF ZOOLOGY
EDMONTON, ALBERTA T6G 2E9, CANADA

CHITA, BERNARDA G A
UNIVERSIDAD CATOLICA DE CHILE
ECOLOGIA MARINA PONT
CASILLA 114-D
SANTIAGO, CHILE

CHIU, SEIN TUCK
HONG KONG BAPTIST COLLEGE
DEPARTMENT OF BIOLOGY
224 WATERLOO ROAD
KOWLOON, HONG KONG

CLARK, AILSA McGOWN
GYLLYNGDUNE, SOUTH ROAD
WIVELSFIELD GREEN
HAYWARDS HEATH
SUSSEX, RH17 7QS ENGLAND, U.K.

COBB, JAMES L.S.
GATTY MARINE LAB
ST. ANDREWS
FIFE, SCOTLAND, U.K.

CODOCEO, MARIA
MUSEO NACIONAL HIST. NATURAL
SECCION HIDROBIOLOGIA
CASILLA 787
SANTIAGO, CHILE

COLON-JONES, ELIZABETH
RSMAS, UNIVERSITY OF MIAMI
DIV. MARINE BIOLOGY FISHERIES
4600 RICKENBACKER CAUSEWAY
MIAMI, FL 33149

CONAND, CHANTAL
UNIVERSITE DE LA REUNION
LABOR. ECOLOGIE MARINE
15 AVENUE RENE CASSIN
SAINT DENIS CEDEX 9, 97715 FRANCE

CONLU, PRUDENCIA
UNIVERSITY OF PHILIPPINES IN
THE VISAYAS, COLLEGE OF FISHERIES
MIAGAO, ILOILO, THE PHILIPPINES

CONSTABLE, ANDREW
GRIFFITH UNIVERSITY
FACULTY ENVIRONMENTAL SCIENCES
NATHAN, QUEENSLAND 4111, AUSTRALIA

COSTA, HENRIQUE R.
DPTO BIOLOGIA MARINA
UFRJ
BI A CCS-I FUNDAO
RIO DE JANEIRO, 21910 BRAZIL

COSTELLOE, JOHN
UNIVERSITY COLLEGE
ZOOLOGY DEPARTMENT
GALWAY, IRELAND

COULON, P.
UNIVERSITE LIBRE DE BRUXELLES
LAB. DE BIOLOGIE MARINE CP 160
50 AV F.D. ROOSEVELT
BRUXELLES B-1050, BELGIUM

COX, ROBERT
UNIVERSITY OF MICHIGAN
DEPT OF GEOLOGICAL SCIENCE
ANN ARBOR, MI 48109

CRUMP, ROBIN
ORIELTON FIELD CENTRE
DYFED
PEMBROKE SA71 5E2 ENGLAND, U.K.

CUENCA, CATHERINE
MUSEUM HISTOIRE DE NANTES
12 RUE VOLTAIRE
NANTES, 44000 FRANCE

CUTRESS, BERTHA M.
THE REGENT
APT. 224
440 ELKS DRIVE
CORVALLIS, OR 97330

DAFNI, JACOB
EILAT COLLEGE
PO BOX 1301
EILAT 88112, ISRAEL

DaHORA, MARIA MP SILVA
MUSEU NACIONAL DA QUIN BV/UFRJ
QUINTA DE BOA VISTA
SAO CHRISTOVAO
RIO DE JANEIRO, 20942 BRAZIL

DAVID, BRUNO
UNIVERSITE DE BOURGOGNE
CENTRE DE SCIENCES DE LA TERRE
6 BD. GABRIEL
DIJON, 21000 FRANCE

DAY, ROB W.
UNIVERSITY MELBOURNE
DEPT. OF ZOOLOGY
GATE 12, ROYAL PARADE
PARKVILLE, VICTORIA 3052, AUSTRALIA

DAYTON III, PAUL K.
SCRIPPS INST. OF OCEANOGR.
DEPT. OF ZOOLOGY, PKO A001
LA JOLLA, CA 92093

DE CELIS, ALEJANDRO K.
NATIONAL MUSEUM
EXECUTIVE BUILDING
RIZAL PARK, ERMITA
MANILA, THE PHILIPPINES

DE RIDDER, CHANTAL
UNIVERSITE LIBRE DE BRUXELLES
LABORATOIRE BIOL.MARINE CP 160
AVE F.D. ROOSEVELT 50
BRUXELLES B-1050, BELGIUM

DEARBORN, JOHN H.
UNIVERSITY OF MAINE
DEPARTMENT OF ZOOLOGY
5751 MURRAY HALL
ORONO, ME 04469

DEBENHAM, PATTY
318 E. VICTORIA ST., APT. C
SANTA BARBARA, CA 93101

DeGREEF, YVES
UNIVERSITE LIBRE DE BRUXELLES
LABOR. BIOLOG. MARINE, CP 160
AVE. F.D. ROOSEVELT 50
BRUXELLES B-1050, BELGIUM

DELAVAUT, ROBERT
UNIVERSITE D'ORLEANS
LAB BIOL CELLULAIRE & ANIMALE
45045 ORLEANS CEDEX
FRANCE

DELMAS, P.
UNIVERSITE D'AIX-MARSEILLE II
LAB. DE ZOOL. MARINE, CERAM
AVE ESC., NORM-NIEMEN
MARSEILLE CEDEX 13, F-13397 FRANCE

DEMARGNE, MICHAEL
RUE DE L'ANCIENNE MAIRIE 38730
VIRIEU SUR BOURBRE, FRANCE

DEPARTMENT, AQUACULTURE
SOUTHEAST ASIAN FISHERIES CTR.
P.O. BOX 256
ILOILO CITY, THE PHILIPPINES

DEUTZMANN, HELMUT
STUECKERSTR. 4
DUESSELDORF 4000, GERMANY

DIACANTONI, ANA MARCOPOULOU -
UNIVERSITY OF ATHENS
SUBFAC. SCIENCE OF EARTH
93 MARATHONODROMOU STR.
MAROUSSI 15125, ATHENS, GREECE

DIEHL, WALTER J.
MISSISSIPPI STATE UNIVERSITY
DEPT. OF BIOLOGICAL SCIENCE
P.O. DRAWER GY
MISSISSIPPI STATE, MS 39762-5759

DOBSON, WILLIAM E.
APPALACHIAN STATE UNIVERSITY
DEPT. OF BIOLOGY
BOONE, NC 28608

DOI, TERUO
KYUSHU UNIVERSITY 33
LAB ECOLOGY, FAC SCIENCE
FUKUOKA, JAPAN

DOLMATOV, IGOR Y.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

DONOVAN, STEPHEN
UNIVERSITY OF THE WEST INDIES
DEPARTMENT OF GEOLOGY
MONA, KINGSTON 7, JAMAICA

DOTAN, AARON
TEL AVIV UNIVERSITY
DEPARTMENT OF ZOOLOGY
RAMAT-AVIV, 69978 ISRAEL

DOWNEY, MAUREEN E.
443 SUTHERLAND ROAD
FRIDAY HARBOR, WA 98250

DROZDOV, ANATOLY L.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

DRUMMOND, ANNE E.
UNIVERSITY OF CAPE TOWN
PERCY FITZPATRICK INSTITUTE
P.O. RONDEBOSCH 7700
SOUTH AFRICA

DUBE, FRANCOIS
UNIV. DU QUEBEC A RIMOUSKI
DEPT. OF OCEANOGRAPHY
QUEBEC, G5L 3A1, CANADA

DUBOIS, PHILIPPE
UNIVERSITE LIBRE DE BRUXELLES
LABORATOIRE BIOL.MARINE CP160
AVE. F.D. ROOSEVELT 50
BRUXELLES B-1050, BELGIUM

DUFRESNE-DUBE, LOUISE
UNIV. DU QUEBEC A RIMOUSKI
DEPARTMENT OF OCEANOGRAPHY
QUEBEC G5L 3A1, CANADA

DURHAM, J. WYATT
UNIVERSITY OF CALIFORNIA
DEPT. OF PALEONTOLOGY
BERKELEY, CA 94720

EBERT, THOMAS A.
SAN DIEGO STATE UNIVERSITY
DEPARTMENT OF BIOLOGY
SAN DIEGO, CA 92182

ECKELBARGER, KEVIN
UNIVERSITY OF MAINE
DARLING MARINE CENTER
25 CLARK'S COVE ROAD
WALPOLE, ME 04573

ECKERT, JAMES D.
16 WEST HAMPTON RD.
ST. CATHERINES, ONTARIO L2T, CANADA

EECKHAUT, IGOR
UNIVERSITE DE MONS-HAINAUT
LAB. DE BIOLOGIE MARINE
19 AV. MAISTRIAU
7000 MONS, BELGIUM

EERNISSE, DOUGLAS J.
UNIVERSITY OF MICHIGAN
MUSEUM OF ZOOLOGY
ANN ARBOR, MI 48109

ELISEIKINA, MARINA G.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

ELLERS, OLAF
UNIVERSITY OF CALIFORNIA
DEPARTMENT OF ZOOLOGY
DAVIS, CA 95616

ELLINGTON, W. ROSS
FLORIDA STATE UNIVERSITY
DEPT. OF BIOLOGICAL SCI., B157
TALLAHASSEE, FL 32306

EMERSON, CAROLYN J.
MEMORIAL UNIV. OF NEWFOUNDLAND
BIOLOGY DEPARTMENT
ST. JOHN'S, NF, A1B 3X9 CANADA

EMLET, RICHARD B.
UNIVERSITY OF OREGON
OREGON INST. OF MARINE BIOLOGY
CHARLESTON, OR 97420

EMSON, ROLAND
DIV. LIFE SCIENCES, KINGS COLL
KENSINGTON CAMPUS
CAMPDEN HILL RD
LONDON W8 7AH, ENGLAND, U.K.

ENDELMAN, LEONID G.
PALEONTOLOGICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES
PROFSOYUSNAYA UL.123
MOSCOW, 117647 RUSSIA

ENGSTROM, NORMAN
NORTHERN ILLINOIS UNIVERSITY
COL. OF LIBERAL ARTS & SCIENCES
OFFICE OF DEAN
DEKALB, IL 60115

ESCOUBET, P.
MARINELAND-AQUARIUMS
306 AVENUE MOZART
06600 ANTIBES, FRANCE

ETNIER, SHELLEY
DUKE UNIVERSITY
243 BIOSCI
BOX 90325
DURHAM, NC 27708-0325

ETTENSON, FRANK R.
UNIVERSITY OF KENTUCKY
DEPT GEOLOGICAL SCIENCES
LEXINGTON, KY 40504

EVDOKIMOV, VLADIMIR V.
TINRO
4. SHEVCHENKO ALLEY
VLADIVOSTOK, 690600 RUSSIA

EYCLERS, JOHN P.
N.C. MUSEUM OF LIFE & SCIENCE
PO BOX 15190
433 MURRAY AVE.
DURHAM, NC 27704

FANKBONER, PETER V.
SIMON FRASER UNIVERSITY
DEPT. OF BIOLOGICAL SCIENCES
BURNABY, B.C., V5A 1S6 CANADA

FARMANFARMAIAN, ALLAHVERDI
RUTGERS UNIVERSITY
NELSON BIOLOGY LAB
P.O. BOX 1059
PISCATAWAY, NJ 08855-1059

FAY, ROBERT O.
UNIVERSITY OF OKLAHOMA
OKLAHOMA GEOLOGICAL SURVEY
830 S. UVAL
NORMAN, OK 73019

FECHTER, HUBERT
ZOOLOGISCHE STAATSSAMMLUNG
MUNCHHAUSENSTR. 21
MUENCHEN 60, D-8000 GERMANY

FEDER, HOWARD M.
UNIV. OF ALASKA, FAIRBANKS
INSTITUTE OF MARINE SCIENCE
FAIRBANKS, AK 99775

FELDMAN, ABBY L.
UNIVERSITY COLLEGE GALWAY
MARTIN RYAN INSTITUTE
DEPARTMENT OF ZOOLOGY
GALWAY, IRELAND

FELL, JULIAN
1545 WELLS PLACE
ERRINGTON, B.C., V0R 1V0 CANADA

FENAUX, LUCIENNE
STATION ZOOLOGIQUE
(CEROV) BP 28
VILLEFRANCHE SUR MER, 06230 FRANCE

FERAL, JEAN-PIERRE
OBSERVATOIRE OCEANOGRAPHIQUE
BANYULS-SUR MER, 66650 FRANCE

FERBER, ILANA
7 MOSHE HESS ST.
JERUSALEM, 94 185 ISRAEL

FERGUSON, JOHN C.
ECKERD COLLEGE
DEPARTMENT OF BIOLOGY
BOX 12560
ST. PETERSBURG, FL 33733

FERRAND, JEAN-GUY
UNIVERSITE D'ORLEANS
LAB BIOL CELLULAIRE & ANIMALE
UER SCIENCES
ORLEANS CEDEX, F 45046 FRANCE

FIERRO, JUAN F.T.
MUSEO DE HISTORIA NATURAL
DE CONCEPCION
CASILLA 1054
CONCEPCION, CHILE

FISHELSON, LEV
TEL-AVIV UNIVERSITY
DEPT. OF ZOOLOGY
155 HERZL ST.
TEL-AVIV, ISRAEL

FLAMMANG, PATRICK
UNIVERSITE DE MONS-HAINAUT
LAB DE BIOLOGIE MARINE
19 AVE MAISTRIAU
7000 MONS, BELGIUM

FLEMING, TIMOTHY P.
2025 OROFINO GULCH
HELENA, MT 59601

FONTAINE, ARTHUR R.
UNIVERSITY OF VICTORIA
DEPT. OF BIOLOGY
VICTORIA, B.C., V8W 2Y2 CANADA

FOSTER, MERRILL W.
BRADLEY UNIVERSITY
DEPT. OF GEOLOGICAL SCIENCES
PEORIA, IL 61625

FOUDA, MOUSTAFA
AL-ASHAR UNIVERSITY
DEPT. OF ZOOLOGY
NASR-CITY
CAIRO, EGYPT

FOURNIER, DANIEL
MUSEUM D'HISTOIRE NATURELLE
1 RUE DOLOMIEU
GRENOBLE, F-3800 FRANCE

FOURNIER, JUDITH A.
CANADIAN MUSEUM OF NATURE
COLLECTIONS DIVISION
P.O. BOX 3443, STATION D
OTTAWA, K1P 6P4 CANADA

FOX, DAVID J.
UNIVERSITY OF TENNESSEE
ZOOLOGY DEPARTMENT
M313 WALTERS LIFE SCI BLDG
KNOXVILLE, TN 37996-0810

FRANKEL, EDGAR
UNIVERSITY OF TECHNOLOGY
GEOLOGY DEPARTMENT
PO BOX 123, BROADWAY 2007
SYDNEY, AUSTRALIA

FRANKLIN, JUAN T.FIERRO
MUSEO REGIONAL DE CONCEPCION
CASILLA 1054
CONCEPCION, CHILE

FRANKLIN, SUE
SYDNEY UNIVERSITY
ZOOLOGY DEPARTMENT A08
SYDNEY, NSW 2006, AUSTRALIA

FRANZEN-BENGTSON, CHRISTINA
SWEDISH MUSEUM NAT HIST
DEPT PALAEZOLOGY
BOX 50007
STOCKHOLM, S-10405 SWEDEN

FREST, TERENCE
UNIVERSITY OF IOWA
DEPARTMENT OF GEOLOGY
IOWA CITY, IA 52242

FUJITA, TOSHIHIKO
NATIONAL SCIENCE MUSEUM
DEPARTMENT OF ZOOLOGY
HYAKUNIN-CHO 3-23-1
SHINJUKU, TOKYO 169, JAPAN

FUKUYAMA, ALLAN K.
7019 157th ST. SW
EDMONDS, WA 98026

GAGE, JOHN D.
DUNSTAFFNAGE MARINE LAB.
PO BOX 3
OBAN, ARGYLL, PA34 4AD SCOTLAND, U.K.

GAGNON, JEAN-MARC
INSTITUT MAURICE-LAMONTAGNE
OCEANOGRAPHIE CHIMIQUE
BOITE POSTALE 1000
MONT-JOLI, QC, G5H 3Z4 CANADA

GALLEMI, JAUME
MUSEU DE GEOLOGIA
PARC DE LA CIUTADELLA S/N
BARCELONA 08003, SPAIN

GARABEDIAN, CARLA J.B.
24 TALBOT ST.
SALINAS, CA 93901

GEBRUK, ANDREW V.
INSTITUTE OF OCEANOGRAPHY
USSR ACADEMY OF SCIENCES
KRASSIKOVA STR., 23
MOSCOW, 117 218 RUSSIA

GENTIL, FRANCK
STATION BIOLOGIQUE
PLACE G. TEISSIER
ROSCOFF, F-29211 FRANCE

GEORGE, SOPHIE
HARBOR BRANCH OCEANOGR. INST.
5600 OLD DIXIE HIGHWAY
FORT PIERCE, FL 34946

GERONIMO, ABELARDO L.
DE LA SALLE UNIVERSITY
DEPARTMENT OF BIOLOGY
2401 TAFT AVENUE
MANILA 1004, PHILIPPINES

GHYOOT, MARIANNE
UNIVERSITE LIBRE DE BRUXELLES
LABORATOIRE DE BIOLOGIE MARINE
50 AV., F.D. ROOSEVELT
BRUXELLES 1050, BELGIUM

GIBSON, MICHAEL
UNIVERSITY OF TENNESSEE
DEPT. GEOSCIENCES AND PHYSICS
222 Eps BUILDING
MARTIN, TN 38238

GIORDANO DE FREITAS, SOLANGE
MUSEU NACIONAL QUINTA DA BOA
VISTA/UFRJ, DEPTO INVERTEBR.
SAO CRISTOVAO, RJ CEP BRAZIL

GIUDICE, GIOVANNI
DEPARTAMENTO DI BIOLOGIA
CELLULARE E DELLO SVILUPPO
VIA ARCHIRAFI 20-90123
PALERMO, ITALY

GLUCHOWSKI, EDWARD L.
SILESIAN UNIVERSITY
DEPT OF EARTH SCIENCES
BEDZINSKA STR. 60
41-200 SOSNOWIEC, POLAND

GLYNN, PETER W.
RSMAS
UNIVERSITY OF MIAMI
4600 RICKENBACKER CAUSEWAY
MIAMI, FL 33149

GOLDBERG, ARTHUR S.
SOUTHAMPTON COLLEGE
OF LONG ISLAND UNIVERSITY
DIVISION OF NATURAL SCIENCES
SOUTHAMPTON, NY 11968

GOLDEN, JULIA
UNIVERSITY OF IOWA
DEPT. OF GEOLOGY
121 TROWBRIDGE HALL
IOWA CITY, IA 52242

GOLDSCHMID, ALFRED
UNIVERSITÄT SALZBURG
ZOOLOGISCHES INSTITUT
AKADEMIESTR 26
SALZBURG A-5020, AUSTRIA

GOODING, RICHARD U.
19 HIGHGATE PARK
ST. MICHAEL BH10, BARBADOS, WEST INDIES

GRABOWSKY, GAIL L.
UNIVERSITY OF HAWAII
KEWALO MARINE LABORATORY
41 AHUI ST.
HONOLULU, HI 96813

GRANGE, KEN R.
NZ OCEANOGRAPHIC INSTITUTE
P.O. BOX 14901
KILBIRNIE, WELLINGTON, NEW ZEALAND

GRAS, HERIBERT
UNIV. KÖLN
ZOOLOGICAL INSTITUTE
WEYERTAL 119
5000 KÖLN 41, GERMANY

GREENSTEIN, BENJAMIN J.
SMITH COLLEGE
DEPARTMENT OF GEOLOGY
NORTHAMPTON, MA 01063

GRENOBLE, MUSEUM DE
1 RUE DOLOMIEU
GRENOBLE 38, FRANCE

GRUZOV, E.N.
ZOOLOGICAL INSTITUTE
ACADEMY OF SCIENCES
LENINGRAD 199164, RUSSIA

GRYGIER, MARK
14804 NOTLEY ROAD
SILVER SPRING, MD 20905

GUENSBURG, THOMAS E.
ROCK VALLEY COLLEGE
PHYSICAL SCIENCE DIVISION
3301 N. MULFORD ROAD
ROCKFORD, IL 61101

GUILLE, ALAIN
LABORATOIRE ARAGO
OBSERVATOIRE Océanologique
BANYULS-SUR-MER, 66650 FRANCE

GUILLOU, MONIQUE
LAB.D'Océanographie Biologique
URA CNRS D1513
6 AVENUE LE GORGEU, BP 809
BREST CEDEX, 29285 FRANCE

GUISO ARANGUIZ, CHITA B.
UNIVERSIDAD AUSTRAL DE CHILE
INSTITUTO DE ZOOLOGIA
CASILLA 567
VALDIVIA, CHILE

GUTIERREZ, JUAN E.
UNIVERSIDAD DE CHILE
INSTITUTO INVEST. Océanologías
CASILLA 1240
ANTOFAGASTA, CHILE

GUTT, JULIAN
ALFRED-WEGENER-INSTITUTE FÜR
POLAR UND MEERESFORSCHUNG
COLUMBUS-STRASSE
BREMERHAVEN, D-27568 GERMANY

HADEL, VALERIA FLORA
CEBIMar-USP
UNIVERSIDADE DE SÃO PAULO
C.P. 83
SÃO SEBASTIAO, SÃO PAULO, CEP BRAZIL

HAMADA, SPENCER
WEST GEORGIA COLLEGE
BIOLOGY DEPARTMENT
CARROLLTON, GA 30118

HAMEL, JEAN-FRANÇOIS
UNIVERSITÉ DU QUÉBEC À RIMOUSKI
DEPT. D'Océanographie
300 ALLEE DES URSULINES
RIMOUSKI, QUÉBEC, G5L 3A1 CANADA

HAMZA HASSAN, MOHAMED
NAT'L INST Océanogr & FISHERIES
RED SEA AND SUEZ CANAL BRANCH
P.O. BOX 182
SUEZ, EGYPT

HARMELIN, JEAN-GEORGES
STATION MARINE D'ENDOUME
13007 MARSEILLE, FRANCE

HARRIOTT, VICKI
UNIVERSITY OF QUEENSLAND
ZOOLOGY DEPARTMENT
ST. LUCIA
4067, BRISBANE, AUSTRALIA

HARRIS, LARRY G.
UNIVERSITY OF NEW HAMPSHIRE
ZOOLOGY DEPARTMENT
DURHAM, NH 03824

HARROLD, CHRISTOPHER
MONTEREY BAY AQUARIUM
RESEARCH DIVISION
886 CANNERY ROW
MONTEREY, CA 93940

HARTMANN, G.
ZOOLOGISCHES INSTITUT
ZOOLOGISCHES MUSEUM
MARTIN LUTHER KING PLATZ 3
2 HAMBURG 13, GERMANY

HARTSOCK, FRANKLIN B.
ALASKA FISHERIES SCIENCE CENTER
KODIAK INVESTIGATIONS
P.O. BOX 1638
KODIAK, AK 99615-1638

HAUDE, REIMUND
INSTITUTE MUSEUM GEOL. PALAONT
GOLDSCHMIDT STR. 3
GOTTINGEN, D-3400 GERMANY

HAY, MARK
INSTITUTE OF MARINE SCIENCE
3407 ARENDELL STREET
MOREHEAD CITY, NC 28557

HAYASHI, HIROSHI
NAGOYA UNIVERSITY
SUGASHIMA MARINE BIOL. LAB.
SUGASHIMA
TOBA, MIE 517, JAPAN

HECKER, R. T.
PALEONTOLOGICAL INSTITUTE
ACADEMY OF SCIENCE USSR
LENINSKY PROSPECT 33
MOSCOW V-71, RUSSIA

HEDDLE, DUNCAN
UNIVERSITY OF ABERDEEN
DEPARTMENT OF ZOOLOGY
TILLYDRONE AVE.
ABERDEEN AB9 2TN, SCOTLAND, UK

HELLER, JAMES A.
THE UNIVERSITY OF TENNESSEE
DEPT. OF GEOLOGICAL SCIENCES
KNOXVILLE, TN 37921

HENDLER, GORDON
L.A. COUNTY MUSEUM NAT. HIST.
LIFE SCIENCES
900 EXPOSITION BLVD.
LOS ANGELES, CA 90007

HERRERA, JOAN
UNIVERSITY OF FLORIDA
DEPARTMENT OF ZOOLOGY
GAINESVILLE, FL 32611

HERRING, P.J.
INSTT. OCEANOGRAPHIC SCIENCES
BROOK ROAD, WORMLEY
GODALMING
SURREY GU8 5UB, ENGLAND, UK

HESS, HANS K.
IM GERSTENACKER 8
CH-4102 BINNINGEN, SWITZERLAND

HIDAKA, MICHIO
UNIVERSITY OF RYUKYUS
DEPARTMENT OF BIOLOGY
SHURI, NAHA
OKINAWA 903, JAPAN

HIGHSMITH, RAYMOND
UNIVERSITY OF ALASKA
INSTITUTE OF MARINE SCIENCES
FAIRBANKS, AK 99775

HILL, ROBERT B.
UNIV OF RHODE ISLAND
DEPARTMENT OF ZOOLOGY
KINGSTON, RI 02881

HIMMELMAN, JOHN H.
UNIVERSITE LAVAL
DEPARTMENT DE BIOLOGIE
QUEBEC, G1K 7P4 CANADA

HODGSON, ALAN N.
RHODES UNIVERSITY
DEPT ZOOLOGY & ENTOMOLOGY
P.O. BOX 94
GRAHAMSTOWN 6140, SOUTH AFRICA

HOEBAUS, ERHARD
ZOOLOGISCHES INSTITUT DER
UNIVERSITAT WIEN
DR KARL LUEGER RING 1
VIENNA, A 1010, AUSTRIA

HOLTERHOFF, PETER F.
UNIVERSITY OF ARIZONA
DEPARTMENT OF GEOSCIENCES
GOULD-SIMPSON BLDG., #77
TUCSON, AZ 85721

HOOPER, ROBERT G.
MEMORIAL UNIVERSITY
DEPARTMENT OF BIOLOGY
ST. JOHN'S, NF, A1B 3X9 CANADA

HOPKINS, THOMAS S.
UNIVERSITY OF ALABAMA
DEPT BIOLOGICAL SCIENCES
BOX 870344
TUSCALOOSA, AL 35487

HOROWITZ, ALAN STANLEY
INDIANA UNIVERSITY
DEPARTMENT OF GEOLOGY
1005 EAST STREET
BLOOMINGTON, IN 47405

HOSHI, MOTONORI
TOKYO INST. TECHNOLOGY
DEPARTMENT OF LIFE SCIENCE
NAGATSUTA, MIDORI-KU
YOKOHAMA 227, JAPAN

HOTCHKISS, FREDERICK H.C.
26 SHERRY ROAD
HARVARD, MA 01451

HUDA, ISHRAT ARA
 ZOOLOGICAL SURVEY DEPARTMENT
 NISHTAR ROAD
 KARACHI, PAKISTAN

HULBERT, ALAN W.
 UNIVERSITY OF NORTH CAROLINA
 ZOOLOGY DEPARTMENT
 WILMINGTON, NC 28403

IMAOKA, TOHRU
 KATATA 2804-3
 SHIRAHAMA, NISHIMURO
 WAKAYAMA, 649-22, JAPAN

IRIMURA, SEIICHI
 1-49-1 OKUSAWA
 SETAGAYA-KU
 TOKYO 158, JAPAN

ISAEVA, VALERIA V.
 INSTITUTE OF MARINE BIOLOGY
 PALCHEVSKY 17
 VLADIVOSTOK, 690041 RUSSIA

IVY, W. GRISILDA
 TRC OF CMFRI
 90 NORTH BEACH ROAD
 TUTICORIN, TAMIL NADU, 628001 INDIA

IWATA, K. S.
 OKAYAMA UNIVERSITY
 DEPARTMENT OF BIOLOGY
 TSUSHIMA NAKA 3 CHOME
 OKAYAMA 700, JAPAN

JABLONSKI, DAVID
 UNIVERSITY OF CHICAGO
 DEPT. GEOPHYSICAL SCIENCES
 5734 S. ELLIS AVENUE
 CHICAGO, IL 60637

JAECKLE, WILLIAM B.
 SMITHSONIAN MAR STA. LINKPORT
 5612 OLD DIXIE HIGHWAY
 FORT PIERCE, FL 34946

JAMES, DANIEL B.
 TRC OF CMFRI
 90 NORTH BEACH ROAD
 TUTICORIN-628 001, TAMIL NADU, INDIA

JAMIESON, GLEN S.
 PACIFIC BIOLOGICAL STATION
 FISHERIES RESEARCH BRANCH
 NANAIMO, B.C., V9R 5K6 CANADA

JANGOUX, MICHEL
 UNIVERSITE LIBRE DE BRUXELLES
 LAB. DE BIOLOGIE MARINE
 50 AVENUE F.D.ROOSEVELT
 BRUXELLES B-1050, BELGIUM

JANIES, DANIEL
 UNIVERSITY OF FLORIDA
 DEPARTMENT OF ZOOLOGY
 GAINESVILLE, FL 32611

JARAMILLO, EDUARDO
 UNIVERSIDAD AUSTRAL DE CHILE
 INSTITUTO DE ZOOLOGIA
 CASILLA 567, VALDIVIA, CHILE

JEAL, FRANK
 TRINITY COLLEGE
 ZOOLOGY DEPARTMENT
 DUBLIN 2, IRELAND

JEFFERIES, R.P.S.
 BRITISH MUSEUM, NATURAL HISTORY
 DEPARTMENT OF PALEONTOLOGY
 CROMWELL ROAD
 LONDON SW7 5BD, ENGLAND, UK

JELL, PETER A.
 QUEENSLAND MUSEUM
 P.O. BOX 3300
 SOUTH BRISBANE, QUEENSLAND, AUSTRALIA

JELLETT, JOANNE
 47 WAKE UP HILL ROAD
 RR#1, CHESTER BASIN
 NOVA SCOTIA, CANADA

JENSEN, MARGIT
 ZOOLOGICAL MUSEUM
 UNIVERSITETSPARKEN 15
 COPENHAGEN, 2100 DENMARK

JOHNSEN, SONKE
 UNIV OF NORTH CAROLINA
 DEPARTMENT OF BIOLOGY
 CHAPEL HILL, NC 27599

JONES, IRA
 CALIFORNIA STATE UNIVERSITY
 DEPARTMENT OF BIOLOGY
 LONG BEACH, CA 90840

JORDON, A. JOHN
 5688 51st STREET
 DELTA, B.C., V4K 3T7 CANADA

JOST, PETER M.
 KANT OBERFORSTAMT, ZURICH
 KASPAR-ESCHER-HAUS
 ZURICH CH-8090, SWITZERLAND

JYO, TAKI
 HOKKAIDO ABASHIRI FISHERIES
 EXPERIMENTAL STATION
 ABASHIRI
 HOKKAIDO 099-31, JAPAN

KAMMER, THOMAS W.
 WEST VIRGINIA UNIVERSITY
 DEPT. OF GEOLOGY
 P.O. BOX 6300
 MORGANTOWN, WV 26506

KANATANI, HARUO
 NAT. INST. FOR BASIC BIOLOGY
 DEPT DEVELOPMENTAL BIOLOGY
 NYODAIJI-CHO, OKAZAKI 444, JAPAN

KAO, M. H.
MEMORIAL UNIV. OF NEWFOUNDLAND
DEPARTMENT OF BIOLOGY
ST. JOHN'S
NEWFOUNDLAND, A1B 3X9 CANADA

KASYANOV, VLADIMIR L.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

KATSURA, SHIGERU
TOKUSHIMA UNIVERSITY
SCHOOL OF DENTISTRY
ORAL ANATOMY
TOKUSHIMA, JAPAN

KAWAMURA, KAZUHIRO
HOKKAIDO CENTRAL FISHERIES
EXPERIMENTAL STATION
YOICHI, HOKKAIDO, JAPAN

KEEGAN, BRENDAN F.
UNIVERSITY COLLEGE
DEPARTMENT OF ZOOLOGY
GALWAY, EIRE

KELLY, STUART M.
7224 16TH AVENUE
TAKOMA PARK, MD 20912

KELSO, DONALD
GEORGE MASON UNIVERSITY
DEPARTMENT OF BIOLOGY
4400 UNIVERSITY DRIVE
FAIRFAX, VA 22030

KENDALL, B.
PO BOX 17032
VIPINGO
VIA MOMBASA, KENYA

KEOUGH, M. J.
UNIVERSITY OF MELBOURNE
ZOOLOGY DEPARTMENT
ADELAIDE, S.A., AUSTRALIA

KIKUCHI, TAJI
KYUSHU UNIVERSITY
AMAKUSA MARINE BIOLOGICAL LAB
TOMIOKA, REIHOKU CHO,
AMAKUSA, KUMAMOTO 863-25, JAPAN

KLIKUSHIN, VLADIMIR
PETERSBURG PALEONTOLOGICAL LAB
26 LINE 9(2)
ST. PETERSBURG, 199026 RUSSIA

KLINGER, THOMAS S.
BLOOMSBURG UNIVERSITY
DEPARTMENT OF BIOLOGY AND
ALLIED HEALTH SCIENCES
BLOOMSBURG, PA 17815

KNOTT, K. EMILY
UNIVERSITY OF ALABAMA
DEPT BIOLOGICAL SCIENCES
PO BOX 870344
TUSCALOOSA, AL 35487

KOBAYASHI, NAOMASA
HIROSHIMA JOGAKUIN COLLEGE
LAB. ENVIRONMENTAL BIOLOGY
USHIDA-HIGASHI, HIGASHI-KU
HIROSHIMA 732, JAPAN

KOGO, ICHIZO
TAGAWA PRIMARY SCHOOL
9-37 TAGAWA 2 CHOME
YODOGAWA-KU, OSAKA 532, JAPAN

KOJIMA, MANABU
TOYAMA UNIVERSITY
DEPARTMENT OF BIOLOGY
GOFUKU 3190
TOYAMA SHI/KEN 930, JAPAN

KOLATA, DENNIS R.
ILLINOIS STATE GEOLOGICAL SURV
NATURAL RESOURCES BUILDING
615 EAST PEABODY DRIVE
CHAMPAIGN, IL 61820-6964

KOMATSU, MIEKO
TOYAMA UNIVERSITY
DEPARTMENT OF BIOLOGY
FACULTY OF SCIENCE
TOYAMA 930, JAPAN

KRISHNAN, MARY BAI
MARINE BIOLOGICAL STATION
ZOOLOGICAL SURVEY OF INDIA
12, LEITHCASTLE STREET
MADRAS 28, INDIA

KRISHNARAJAH, PADMINI
UNIVERSITY OF JAFFNA
DEPARTMENT OF ZOOLOGY
JAFFNA, SRI LANKA

KRISTAN-TOLLMANN, EDITH M.K.
SCHEIBENBERGSTRASSE 53/6
A-1180 WIEN, AUSTRIA

KROLL, DIETER K.
INSTITUT FUR OKOLOGIE
ABT HYDROBIOLOGIE
POSTFACH 103764
ESSEN, 45117 GERMANY

KROPACH, CHAIM
IOLR, PO BOX 8030
HAIFA, ISRAEL

KURIHARA, TAKEO
KYOTO UNIVERSITY
DEPARTMENT OF FISHERY
FACULTY OF AGRICULTURE
KYOTO 606, JAPAN

KUSHLINA, VERONIKA B.
PALEONTOLOGICAL INSTITUTE
PROFSOJUZNAYA UL. 123
GSP-7 V-321
MOSCOW, 1171868 RUSSIA

LaBARBARA, MICHAEL
THE UNIVERSITY OF CHICAGO
DEPARTMENT OF ANATOMY
1025 EAST 57th STREET
CHICAGO, IL 60637

LAHAYE, MARIE-CHRISTINE
UNIVERSITE LIBRE DE BRUXELLES
LABORATOIRE BIOL.MARINE,CP 160
AVE F.D. ROOSEVELT 50
BRUXELLES 1050, BELGIUM

LAMBERT, PHILIP
ROYAL BRITISH COLUMBIA MUSEUM
BIOLOGY SECTION
675 BELLEVILLE STREET
VICTORIA, B.C., V8V 1X4 CANADA

LANE, N. GARY
INDIANA UNIVERSITY
GEOLOGY DEPARTMENT
BLOOMINGTON, IN 47405

LANG, GUNTER
NATIONAL UNIVERSITY SINGAPORE
DEPARTMENT OF ZOOLOGY
KENT RIDGE
0511 SINGAPORE

LARES, MICHAEL
UNIVERSITY OF SOUTH FLORIDA
DEPARTMENT OF BIOLOGY
TAMPA, FL 33620

LARRAIN, ALBERTO P.
UNIVERSIDAD DE CONCEPCION
DEPARTAMENTO DE BIOLOGIA
CONCEPCION, CHILE

LAWRENCE, JOHN M.
UNIV OF SOUTH FLORIDA
DEPARTMENT OF BIOLOGY
4202 EAST FOWLER AVE, LIF 136
TAMPA, FL 33620-5150

LAYOUS, YVES
29 RUE PIERRE NICOLE
PARIS, 75005 FRANCE

LE MENN, JEAN
UNIV. DE BRATAGNE OCCIDENTALE
LAB. DE P & S DE PALEOZOIC
6. AV LE GORGEU
BREST, 29275 FRANCE

LE MENN, JEAN
LAB PALEONTOLOGIE & STRATIGRAPHIE
DU PALEOZOIQUE - UFR SCIENCES
6 AV. LE GORGEU
BREST CEDEX, 29287 FRANCE

LeCLAIR, ELIZABETH E.
THE UNIVERSITY OF CHICAGO
DEPT. GEOPHYSICAL SCIENCES
5734 S. ELLIS AVE.
CHICAGO, IL 60637

LECLERC, MICHAEL
ORLEANS UNIVERSITY
BIOLOGY DEPT, UER SCIENCES
ORLEANS, 45045 FRANCE

LEELING, BEATRIX
ZOOLOGISCHES INSTITUT & MUSEUM
UNIVERSITAT HAMBURG
MARTIN LUTHER KING PLATZ 3
HAMBURG 13, GERMANY

LEIBSON, NINA L.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

LESSER, MICHAEL P.
UNIVERSITY OF NEW HAMPSHIRE
DEPARTMENT OF ZOOLOGY
SPAULDING LIFE SCIENCE BUILDING
DURHAM, NH 03824-3544

LESSIOS, HARIS A.
SMITHSONIAN TROP RESEARCH INST
UNIT 0948, APO AA
MIAMI, FL 34002-0948

LEVERONE, JAY R.
MOTE MARINE LABORATORY
1600 THOMPSON PARKWAY
SARASOTA, FL 34234

LEVIN, V. S.
FAR EAST SCIENCE CENTER
INSTITUTE OF MARINE BIOLOGY
VLADIVOSTOK, 690022 RUSSIA

LEVIN, VALERY S.
KAMCHATKA DEPT MAR. BIOL. & BIOTECH
PO BOX 197
PETROPAVLOVSK-KAMCHATSKY, 863000 RUSSIA

LEVINGS, C. D.
PACIFIC ENVIRONMENT INSTITUTE
4160 MARINE DRIVE
WEST VANCOUVER, B.C., V7V1N6 CANADA

LEVITAN, DONALD R.
FLORIDA STATE UNIVERSITY
DEPT OF BIOLOGICAL SCIENCE
B-142
TALLAHASSEE, FL 32306-2043

LIAO, YULIN
ACADEMIA SINICA
INSTITUTE OF OCEANOLOGY
7 NAN-HAI ROAD
QINGDAO, CHINA

LITVINOVA, NINA M.
USSR ACADEMY OF SCIENCES
INSTITUTE OF OCEANOLOGY
23 KRASIKOVA
MOSCOW, 117218 RUSSIA

LOPEZ-IBOR, ALICIA
UNIVERSIDAD COMPLUTENSE
CATERA DE ZOOL INVERTEBRADOS
MADRID 3, SPAIN

LORDSON, JINBERT
TRC OF CMFRI
90, NORTH BEACH ROAD
TUTICORIN, TAMIL NADU, 628 001 INDIA

LOVELY, ERIC C.
UNIVERSITY OF NEW HAMPSHIRE
DEPARTMENT OF ZOOLOGY
SPAULDING LIFE SCIENCE BUILDING
DURHAM, NH 03824-3544

LUBCHENCO, JANE
OREGON STATE UNIVERSITY
DEPARTMENT OF ZOOLOGY
CORDLEY 3029
CORVALLIS, OR 97331

LUCAS, JOHN
JAMES COOK UNIVERSITY
SCHOOL OF BIOLOGICAL SCIENCES
TOWNSVILLE, QUEENSLAND 4811, AUSTRALIA

LUTZEN, JORGEN
UNIVERSITY OF COPENHAGEN
INST OF COMPARATIVE ANATOMY
UNIVERSITETSPARKEN 15
2100 COPENHAGEN, DENMARK

MACURDA, JR., D.BRADFORD
214 LEAFLET LANE
SPRING, TX 77388

MACZYNSKA, STEFANIA-ST.
POLISH ACADEMY OF SCIENCES
MUSEUM OF THE EARTH
20-26 AL. NA
SKARPIE, 00-488 WARSAW, POLAND

MAGNIEZ, PIERRE
MUSEUM D'HISTOIRE NATURELLE
LAB BIOL. INVERTEBRES MARINES
55 RUE DE BUFFON
PARIS 75005, FRANCE

MAH, CHRISTOPHER
1754 27TH AVENUE
SAN FRANCISCO, CA 94122

MAHARAVO, JEAN
CENTRE NATIONAL DE RECHERCHES
D'OCEANOGRAPHIQUES
B.P. 68
(207) NOSY-BE, MADAGASCAR

MAIER, MARTA
CIUDAD UNIVERSITARIA, PAB. II
DEP. DE QUIMICA ORGANICA
FACULTAD DE CS. EX. Y NAT.
1128 BUENOS AIRES, ARGENTINA

MAJEROWICZ, EUGENE
4449 PRESIDIO DRIVE
LOS ANGELES, CA 90008

MALLEFET, J.
UNIV. CATHOLIQUE DE LOUVAIN
LAB DE PHYSIOLOGIE ANIMALE
CLAUDE BERNARD-PL CROIX DU SUD, 5
B-1348 LOUVAIN-LA-NEUVE, BELGIUM

MANCHENKO, GENNADY P.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

MAPLES, CHRISTOPHER G.
KANSAS GEOLOGICAL SURVEY
1930 CONSTANT AVE.
LAWRENCE, KS 66047

MARCOS-DIEGO, CONCEPCION
UNIVERSIDAD DE MURCIA
DEPARTAMENTO DE ECOLOGIA
FACULTAD DE BIOLOGIA
MURCIA, 30100 SPAIN

MARKOV, ALEXANDER V.
PALEONTOLOGICAL INSTITUTE
PROFSOJUZNAYA UL. 123
MOSCOW, 117868 RUSSIA

MARQUES, V.M.A.M.
DEPT ZOOLOGIA & ANTROPLLOGIA
FACULDADE CIENCIAS DE LISBOA
RUA DA ECOLOGIA POLITECNICA
1200 LISBON, PORTUGAL

MARSH, LOISETTE M.
WESTERN AUSTRALIAN MUSEUM
FRANCIS STREET
PERTH, WESTERN AUSTRALIA 6000, AUSTRALIA

MARSHALL, CHARLES
UNIVERSITY OF CALIFORNIA
DEPARTMENT OF EARTH AND
PLANETARY SCIENCES
LOS ANGELES, CA 90024

MARTIN, R.ERIK
APPLIED BIOLOGY, INC.
PO BOX 974
JENSEN BEACH, FL 34958

MARTIN, RICHARD B.
CSIRO MARINE LABORATORIES
DIVISION OF FISHERIES
GPO BOX 1538, HOBART
TASMANIA 7001, AUSTRALIA

MASACARENHAS, BERNARDO DE A.
MUSEU NACIONAL
QUINTA DA BOA VISTA S/NO
SAO CRISTOVAO, RIO DE JANEIRO, BRAZIL

MASSIN, CLAUDE
INST ROYAL SCIENCES NATURELLES
DE BELGIQUE
29 RUE VAUTIER
1040 BRUXELLES, BELGIUM

MATERIA, CHRISTINE J.
PARKS & WILDLIFE SERV.
WILDLIFE SECTION
GPO BOX 44A
HOBART, TASMANIA, 7001 AUSTRALIA

MATTOS-SEGOVIA, ELIO
UNIVERSIDAD ARTURO PRAT
DEPARTAMENTO DE INGENIERIA
CASILLA 121
IQUIQUE, CHILE

MATURO, JR., FRANK
UNIVERSITY OF FLORIDA
ZOOLOGY DEPARTMENT
GAINESVILLE, FL 32611

MAYTIA, LIC SÚSANA
MUSEO NACIONAL DE HISTORIA NAT
CC399
MONTEVIDEO, URUGUAY

McCARTHY, DANIEL
FLORIDA STATE UNIVERSITY
DEPARTMENT OF BIOLOGY
TALLAHASSEE, FL 32304

McCLINTOCK, JAMES B.
UNIVERSITY OF ALABAMA
DEPT. OF BIOLOGY
UAB STATION
BIRMINGHAM, AL 35294

McEDWARD, LARRY
UNIVERSITY OF FLORIDA
DEPARTMENT OF ZOOLOGY
223 BARTRAM HALL
GAINESVILLE, FL 32611

McGEE, PAULA E.
MILWAUKEE PUBLIC MUSEUM
DEPT. OF GEOLOGY
800 WEST WELLS STREET
MILWAUKEE, WI 53233-1478

McINTOSH, GEORGE CLAY
ROCHESTER MUSEUM & SCIENCE CTR
657 EAST AVE.
PO BOX 1480
ROCHESTER, NY 14620

McKENZIE, J. DOUGLAS
SCOTTISH ASSOC. MARINE SCIENCE
PO BOX 3
OBAN, ARGYLL, PA34 4AD SCOTLAND, U.K.

McKINNEY, MICHAEL
UNIVERSITY OF TENNESSEE
DEPT. GEOLOGY
KNOXVILLE TN 37966

McKNIGHT, DONALD
N.Z. OCEANOGRAPHIC INSTITUTE
P.O. BOX 14901
KILBIRNIE, WELLINGTON, NEW ZEALAND

MCMURRAY, SHEONA
GLASGOW POLYTECHNIC
COWCADDENS ROAD
GLASGOW G4 0BA, SCOTLAND, U.K.

McNAMARA, KENNETH
WESTERN AUSTRALIAN MUSEUM
FRANCIS STREET
PERTH, WESTERN AUSTRALIA 6000, AUSTRALIA

MEDEIROS-BERGEN, DOT E.
UNIVERSITY OF NEW HAMPSHIRE
DEPARTMENT OF ZOOLOGY
SPAULDING LIFE SCIENCE BLDG.
DURHAM, NH 03824-3544

MELJER, LAURENT
CNRS
STATION BIOLOGIQUE
29682 ROSCOFF CEDEX, FRANCE

MEIN, BIRGIT
ZOOLOG. INST. UND ZOOLOGISCHES,
MUSEUM DER UNIVERSITÄT HAMBURG
MARTIN LUTHER KING PLATZ 3
2000 HAMBURG 13, GERMANY

MENGE, BRUCE A.
OREGON STATE UNIVERSITY
DEPARTMENT OF ZOOLOGY
CORVALLIS, OR 97331

MESSING, CHARLES G.
NOVA UNIV OCEANOGRAPHIC CENTER
8000 N. OCEAN DRIVE
DANIA, FL 33004

MEYER, CHRISTIAN A.
GEOLOGICAL INSTITUTE
BALTZERSTRASSE 1
CH-3012 BERNE, SWITZERLAND

MEYER, DAVID L.
UNIVERSITY OF CINCINNATI
DEPARTMENT OF GEOLOGY
CINCINNATI, OH 45221

MINTZ, LEIGH W.
CALIFORNIA STATE UNIVERSITY
OFFICE OF ACADEMIC PROGRAMS
WA 859
HAYWARD, CA 94542

MIRONOV, ALEXANDER
USSR ACADEMY OF SCIENCES
INSTITUTE OF OCEANOLOGY
KRASIKOVA 23
MOSCOW, 117218 RUSSIA

MITROVIC, JOVANKA P.
FACULTY OF MINING & GEOLOGY
KAMENICKA 6, PO BOX 227
11000 BEOGRAD, YUGOSLAVIA

MLADENOV, PHILIP V.
UNIVERSITY OF OTAGO
DEPARTMENT OF MARINE SCIENCE
PO BOX 56
DUNEDIN, NEW ZEALAND

MOCRETSOVA, NINA D.
PACIFIC RESEARCH INSTITUTE
OF FISHERIES AND OCEANOGRAPHY
4. SHEVCHENKO ALLEY
VLADIVOSTOK, 690600 RUSSIA

MOOI, RICHARD
CALIFORNIA ACADEMY OF SCIENCES
INVERTEBRATE ZOOLOGY
GOLDEN GATE PARK
SAN FRANCISCO, CA 94118

MOORE, ANDREW
GATTY MARINE LAB
EAST SANDS
ST. ANDREWS, FIFE, SCOTLAND, U.K.

MORISHITA, AKIRA
NAGOYA UNIVERSITY
DEPARTMENT OF EARTH SCIENCES
CHIKUSA
NAGOYA, JAPAN

MORRILL, JOHN
NEW COLLEGE-USF
DIVISION OF NATURAL SCIENCES
5700 N. TRAIL
SARASOTA, FL 34243

MOTOKAWA, TATSUO
TOKYO INSTITUTE OF TECHNOLOGY
FACULTY OF SCIENCE; BIOL. LAB.
OKAYAMA, MEGURO-KU
TOKYO 152, JAPAN

MOURA-BRITTO, MAURO DE
RUA RIO GRANDE DO SUL
907/63-B
CURITIBA, PR, 80610-100 BRAZIL

MU, A.T.
INSTITUTE OF GEOLOGY
AND PALEONTOLOGY
ACADEMIA SINICA
NANJING, PEOPLE'S REPUBLIC OF CHINA

MU, EN-ZHI
INSTITUTE OF GEOLOGY
AND PALEONTOLOGY
ACADEMIA SINICA
NANJING, PEOPLE'S REPUBLIC OF CHINA

MUKAI, HIROSHI
HOKKAIDO UNIVERSITY
AKKESHI MARINE BIOLOGICAL STA.
AKKESHI
HOKKAIDO 088-11, JAPAN

MUNAR-BERNAT, JAIME
C/O JOSE ALEMANY
VICH 6 1-3
E-07010 PALMA DE MALLORCA
BALEARIC ISLANDS, SPAIN

MUNK, ERIC J.
ALASKA FISHERIES SCIENCE CENTR
KODIAK INVESTIGATIONS
P.O. BOX 1638
KODIAK, AK 99615-1638

NAGAHAMA, YOSHITAKA
NATIONAL INSTITUTE BASIC BIOL
LAB OF REPRODUCTIVE BIOLOGY
OKAZAKI 444, JAPAN

NAIDENKO, TAMARA K.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

NAKAMURA, RAYMOND K.
UNIVERSITY OF TORONTO
DEPARTMENT OF ZOOLOGY
25 HARBORD STREET
TORONTO, ONTARIO, M5S 1A1 CANADA

NAKANO, EIZO
IWASAKI-ASHIHAZAMA 112-1407
NISSHIN, AICHI 470-01, JAPAN

NATEEWATNANA, ANUWAT
PHUKET MARINE BIOL. CENTER
P.O. BOX 60
PHUKET 83000, THAILAND

NAUEN, CORNELIA
INSTITUT FUR MEERESKUNDE
DUSTERNBROOKER WEG 20
2300 KIEL 1, GERMANY

NEBELSICK, JAMES H.
INSTITUT FUR PALAEONTOLOGIE
UNIVERSITAT TUBINGEN
SIGWARTSTR. 10
TUBINGEN, D-72076 GERMANY

NEMOTO, SHIN-ICHI
OCHANOMIZU UNIVERSITY
TATEYAMA MARINE LABORATORY
KOH-YATSU, UMI-NO-HOSHI
TATEYAMA, CHIBA 294-03, JAPAN

NESTLER, HELMUT
GEOLOG.-PALEONTOL. INSTITUT
UNIVERSITAT GRIEFSWALD
FREIDRICH-LUDWIG-JAHN STR 17A
GRIEFSWALD, D-17489 GERMANY

NEUMANN, CHRISTIAN
FREIE UNIVERSITAT BERLIN
INSTITUT FUR PALAONTOLOGIE
MALTESERSTR. 74-100
BERLIN 12249, GERMANY

NICHOLS, DAVID
UNIVERSITY OF EXETER
HATHERLY LABORATORIES
PRINCE OF WALES RD.
EXETER, EX4 4PS ENGLAND

NIESEN, THOMAS
SAN FRANCISCO STATE UNIVERSITY
DEPT. MARINE BIOLOGY, DIV.BIOL
1600 HOLLOWAY AVE.
SAN FRANCISCO, CA 94132

NISHIHARA, MORITAKA
TOHOKU UNIVERSITY
FACULTY OF SCIENCE
BIOLOGICAL INSTITUTE
SENDAI 980-77, JAPAN

NOJIMA, S.
KUMAMOTO UNIVERSITY
AITSU MARINE BIOLOGICAL LAB.
AITSU, MATSUSHIMA-CHO, AMAKUSA
KUMAMOTO-KEN 861-61, JAPAN

NORRIS, DANIEL R.
UNIVERSITY OF GUAM
MARINE LABORATORY
UOG STATION
MANGILAO, GUAM 96923

O'CONNOR, BRENDAN D.S.
12 KILKERRIN PARK
LIOSBANN, GALWAY, IRELAND

O'HARA, TIMOTHY D.
MUSEUM OF VICTORIA
DEPT. OF INVERTEBRATE ZOOLOGY
MELBOURNE 3000, VICTORIA, AUSTRALIA

O'LOUGHLIN, P. MARK
256 QUEENS PARADE
CLIFTON HILL 3068, AUSTRALIA

O'NEILL, PATRICIA
UNIVERSITY OF WEST. AUSTRALIA
DEPARTMENT OF ZOOLOGY
NEDLANDS, W.A. 6000, AUSTRALIA

OGURO, CHITARU
TOYAMA UNIVERSITY
DEPARTMENT OF BIOLOGY
TOYAMA 930, JAPAN

OHTA, SUGURU
UNIVERSITY OF TOKYO
OCEAN RESEARCH INSTITUTE
MINAMIDAI 1-15-1, NAKANO
TOKYO 164, JAPAN

OJEDA, F. PATRICIO
UNIVERSIDADE CATOLICA
DEPARTAMENTO DE ECOLOGIA
CASILLA 114-D
SANTIAGO, CHILE

OJI, TATSUO
UNIVERSITY OF TOKYO
GEOLOGICAL INSTITUTE
7-3-1 HONGO
TOKYO 113, JAPAN

OKADA, MINORU
SCIENCE EDUCATION INST OSAKA PREF
KARITA 4-CHOME
SUMIYOSHI-KU
OSAKA 558, JAPAN

OKAZAKI, KAYO
TOKYO METROPOLITAN UNIVERSITY
DEPARTMENT OF BIOLOGY
FUKAZAWA 2-1-1, SETAGAYA-KU
TOKYO 158, JAPAN

OLAVE, SERGIO
INSTITUTO DE FOMENTO PESQUERO
CASILLA 78
CASTRO, CHILE

OLVER, JANE
LANCE'S COTTAGE
PARKGATE ROAD, NEWDIGATE
SURREY, RH5 5DY ENGLAND, U.K.

ORLER, PARICIA MABEL
CADIC CC.92 USHUAIA
TIERRA DEL FUEGO, ARGENTINA

OTSU, INES
INST INVESTIGACIONES OCEANOLOG
UNIVERSIDAD DE CHILE
CASILLA 1240
ANTOFAGASTA, CHILE

PABIAN, ROGER K.
UNIVERSITY OF NEBRASKA
CONSERVATION & SURVEY DIVISION
P.O. BOX 880517
LINCOLN, NE 68588-0517

PAGETT, RICHARD MICHAEL
HUNTERS BROOK HOUSE
HOGGS LANE, PURTON
WILSHIRE, SN5 9HQ ENGLAND U.K.

PAINE, ROBERT T.
UNIVERSITY OF WASHINGTON
DEPARTMENT OF ZOOLOGY
SEATTLE, WA 98195

PALUMBI, STEVE
UNIVERSITY OF HAWAII
DEPT. ZOOL & KEWALO MAR LAB
HONOLULU, HI 96822

PAPE-LINDSTROM, PAMELA
UNIVERSITY OF SOUTH CAROLINA
BIOLOGY DEPARTMENT
COLUMBIA, SC 29210

PARDO, ROBERTO A.
UNIVERSIDAD DEL VALLE
DEPARTAMENTO DE BIOLOGIA
A.A. 25360
CALI, COLOMBIA

PARMA, GRACIELA
CIUDAD UNIVERSITARIA. PAB II
DEPARTAMENTO DE GEOLOGIA
FACULTAD DE CS. EX. Y NAT.
1128 BUENOS AIRES, ARGENTINA

PARSLEY, RONALD
TULANE UNIVERSITY
DEPARTMENT OF GEOLOGY
NEW ORLEANS, LA 70118

PASTOR, XAVIER
LAB OCEANOGRÁFICO DE BALEARES
MUELLE DE PELAIRES S/N
PALMA DE MALLORCA
BALEARIC ISLANDS, SPAIN

PAUL, C.R.C.
LIVERPOOL UNIVERSITY
DEPARTMENT OF GEOLOGY
LIVERPOOL, L69 3BX ENGLAND, U.K.

PAULS, SHEILA MARQUES
UNIVERSIDAD CENTRAL VENEZUELA
INSTITUTO DE ZOOLOGIA TROPICAL
APARTADO 47058
CARACAS 1041-A, VENEZUELA

PAWSON, DAVID L.
SMITHSONIAN INSTITUTION
NAT. MUSEUM OF NATURAL HISTORY
ROOM W323, MAIL STOP 163
WASHINGTON, DC 20560

PAYOT, FLORENCE
ODENSE UNIVERSITY
INSTITUTE OF BIOLOGY
CAMPUSVEJ 55
ODENSE, DK 5230 DENMARK

PEARSE, JOHN S.
UNIVERSITY OF CALIFORNIA
INSTITUTE OF MARINE SCIENCES
SANTA CRUZ, CA 95064

PENCHASZADEH, PABLO E.
UNIV. SIMON BOLIVAR
INTECMAR
APARTADO 80659
CARACAS, VENEZUELA

PENNINGTON, J. TIMOTHY
KEWALO MARINE LAB
41 AHUI STREET
HONOLULU, HI 96813

PEREZ-RUZAFÁ, ANGEL
UNIVERSIDAD DE MURCIA
DEPARTAMENTO DE ECOLOGIA
FACULTAD DE BIOLOGIA
MURCIA, 30100 SPAIN

PETR, VACLAV
CHARLES UNIVERSITY
DEPT. OF PALEONTOLOGY
ALBERTOV 6
128 43 PRAHA 2, CZECH REPUBLIC

PHILIPPE, MICHAEL
MUSEE GUIMET D'HIST NATURELLE
28 BD DES BELGES
LYON, 69006 FRANCE

PIEPENBURG, DIETER
INSTITUTE FOR POLAR ECOLOGY
WISCHHOFSTR. 1-3, GEB. 12
KIEL, D-24148 FED. REP. GERMANY

PIKE, ARLENE J.
DALLAS MUSEUM OF NAT HIST
P.O. BOX 150349
DALLAS, TX 75315

PINELA, JEAN E.
UNIVERSIDAD AUSTRAL DE CHILE
INSTITUTO DE ZOOLOGIA
CASILLA 567
VALDIVIA, CHILE

POLSON, EMMA
UNIV OF SOUTH FLORIDA
DEPARTMENT OF BIOLOGY
TAMPA, FL 33620

POMORY, CHRISTOPHER
UNIVERSITY OF SOUTH FLORIDA
DEPARTMENT OF BIOLOGY
TAMPA, FL 33620

PORETZKAJA, E. S.
V-34, 1 LINE, 10 APRTM. 21
LENINGRAD, 199034 RUSSIA

PRESTEDGE, GEOFFREY
16 GEEVES CRESCENT
MIDWAY POINT, TASMANIA 7171, AUSTRALIA

PROKOP, RUDOLF JAN
NATIONAL MUSEUM
DEPT. OF PALAEONTOLOGY
VACLAVSKE NAM. 68
115 79 PRAHA 1, CZECH REPUBLIC

PROPP, M. V.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

RAHAMAN, ABDUL ABDUL
SRI VASAVI COLLEGE
PROFESSOR OF ZOOLOGY
ERODE-G38 31B, INDIA

RAJAKUMA, C. R.
UNIVERSITY COLLEGE
DEPT. OF ZOOLOGY
GHIRUVANANTHAPURAM
KERALA STATE, INDIA

RAYMOND, ALAN M.
UNIVERSITY OF ST. ANDREWS
GATTY MARINE LAB
ST. ANDREWS
FIFE KY168LB, SCOTLAND, U.K.

REGIS, MARIE-BERTHE
FACUL SCI & TECH DE ST. JEROME
CERAM-CASE 3U1
MARSEILLE CEDEX 13, 13397 FRANCE

REGNAULT, SERGE
MUSEUM D'HISTOIRE NATURELLE, 12
RUE VOLTAIRE
NANTES, 44000 FRANCE

REGNELL, GERHARD
GEOLOGISKA INSTITUTIONEN
SOLVEGATAN 13
S-223 62 LUND, SWEDEN

RHO, BOON JO
EWH A WOMENS UNIVERSITY
DIR OF NATURAL HISTORY MUSEUM
SEOUL 120, KOREA

ROBERTS, DAI
QUEEN'S UNIVERSITY
SCHOOL OF BIOLOGY AND BIOCHEM.
BELFAST, BT9 7BL NORTHERN IRELAND, U.K.

ROBISON, RICHARD
UNIVERSITY OF KANSAS
DEPARTMENT OF GEOLOGY
LAWRENCE, KS 66045

ROCCATAGLIATA, ALEJANDRO J.
UNIVERSIDAD DE BUENOS AIRES
FACULTAD DE CIENCIAS EX. Y NAT
PABELLON 2, CID UNIVERSITARIA
BUENOS AIRES 1428, ARGENTINA

RODRIGUEZ, SEBASTIAN
UNIVERSIDAD CATOLICA DE CHILE
DEPTO. BIOL. CELULAR Y MOLEC.
FACULTAD DE CIENCIAS BIOLOG.
CASILLA 114-D, SANTIAGO, CHILE

ROGERS-BENNETT, LAURA
BODEGA MARINE LABORATORY
BAY FLAT ROAD
BODEGA BAY, CA 94923

ROMINAS-CASTRO, LILY
NATIONAL INSTITUTE FISHERIES
P.O. BOX 1306
ENSENADA, BAJA CALIFORNIA, MEXICO

ROSE, EDWARD P.F.
ROYAL HOLLOWAY & BEDFORD N COL
UNIVERSITY OF LONDON, EGHAM
DEPARTMENT OF GEOLOGY
SURREY, TW20 0EX ENGLAND, U.K.

ROTMAN, HELEN CLARK
N.Z. OCEANOGRAPHIC INSTITUTE
NIWAR
PO BOX 14901
KILBIRNIE, WELLINGTON, NEW ZEALAND

ROUX, MICHEL
UNIVERSITE DE REIMS
LABORATOIRE DES SCIENCES
DE LA TERRE, B.P. 347
REIMS CEDEX, 51062 FRANCE

ROWE, FRANK
GOLDBROOK BOARDING KENNELS
NUTTERY VALE, CROSS STREET
HOXNE
SUFFOLK, IP21 5EB ENGLAND, U.K.

ROZHN OV, S. V.
PALEONTOLOGICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES
PROFSOYUSNAYA STR. 123
MOSCOW, 117647 RUSSIA

RUMRILL, STEVEN S.
SOUTH SLOUGH NATIONAL ESTUARINE RESERVE
P.O. BOX 5412
CHARLESTON, OR 97420

RYABUSHKO, VITALY
INSTITUTE OF BIOLOGY OF THE
SOUTHERN SEAS, DEPT ANIMAL PHYSIOL.
2 NAKHIMOV AVE
SEVASTOPOL, 335001 UKRAINE

SANCHEZ, PATRICIO
UNIVERSIDADE CATOLICA
FACULTAD DE CIENC. BIOLOGICAS
CASILLA 114-D
SANTIAGO, CHILE

SASTRY, DWADASI R.K.
ZOOLOGICAL SURVEY OF INDIA
FPS BUILDING
27 JAWAHARLAL NEHRU ROAD
CALCUTTA, 700016 INDIA

SATO, HIDE MI
NAGANO UNIVERSITY
FACULTY OF SOCIAL SCIENCE
SHIMONOGO, UEDA,
NAGANO 386-12, JAPAN

SAUER DE AVILA PIRES, TERESA C.
CIUDADE UNIVERSITARIA
DEPTO DE ZOOLOGICA/UFRJ
ILHA DO FUND AO, CCS-SALA A1-117
RIO DE JANEIRO, 21.941 BRAZIL

SCALLY, KEVIN
CANTERBURY HEALTH LIMITED
CHRISTCHURCH HOSP, DENTAL SERV
P.O. BOX 1600
CHRISTCHURCH, NEW ZEALAND

SCHELTEMA, RUDOLF S.
WOODS HOLE OCEANOGRAPHIC INST.
DEPARTMENT OF BIOLOGY
WOODS HOLE, MA 02543

SCHINNER, G.
UNIVERSITY OF VIENNA
INSTITUTE OF ZOOLOGY
VIENNA 1-1090, AUSTRIA

SCHMINCKE, SABINE
UNIV. WURZBURG
PALAEONTOLOGISCHES INSTITUT
PLEICHERWALL 1
WURZBURG 8700, GERMANY

SCHOPPE, SABINE
JUSTUS-LIEBIG UNIVERSITAT
INST ALLGEMEINE SPEZ. ZOOLOGIE
STEPHANSTR. 24
GIESSEN, D-35390 GERMANY

SCHUETZ, ALLEN W.
JOHNS HOPKINS UNIVERSITY
SCH HYGIENE & PUBLIC HEALTH
615 N. WOLFE ST.
BALTIMORE, MD 21205-2179

SCHUMACHER, HELMUT
UNIVERSITAT ESSEN
INST. FUR OKOLOGIE
POSTFACH 10 37 64
ESSEN 1, D4300 GERMANY

SERAFY, D. KEITH
SOUTHAMPTON COLLEGE
DEPARTMENT OF BIOLOGY
SOUTHAMPTON, NY 11968

SEVASTOPULO, GEORGE
UNIVERSITY OF DUBLIN
TRINITY COLLEGE
DEPT OF GEOLOGY
DUBLIN 2, IRELAND

SEWELL, MARY
CANADIAN WILDLIFE SERVICE
P.O. BOX 340
DELTA, B.C., V4K 3Y3 CANADA

SHEPHERD, SCORESBY A.
S.A. RESEARCH AND DEV. INSTIT.
BOX 1625 G.P.O.
ADELAIDE, S.A. 5001, AUSTRALIA

SHICK, MALCOLM
UNIVERSITY OF MAINE
DEPT. OF ZOOLOGY
5751 MURRAY HALL
ORONO, ME 04469

SHIRAI, HIROKO
NATIONAL INST FOR BASIC BIOLOG
LAB OF REPRODUCTIVE BIOLOGY
OKAZAKI, AICHI-KEN 444, JAPAN

SHIRLEY, THOMAS C.
JUNEAU CENTER FOR FISHERIES &
OCEAN SCIENCES, UAF
11120 GLACIER HWY.
JUNEAU, AK 99801

SIBUET, MYRIAM
IFREMER CENTRE DE BREST
BP 70
PL. OULZANE, 29280 FRANCE

SIDES, LIZ
TRINITY COLLEGE
ENVIRONMENTAL SCIENCE UNIT
DUBLIN 2, IRELAND

SIEGEL, I. MYRA
PO BOX 6202
CAPE ELIZABETH, ME 04107-0002

SIMMS, MICHAEL J.
NATIONAL MUSEUM OF WALES
DEPARTMENT OF GEOLOGY
CATHAYS PARK
CARDIFF, CF1 3NP WALES, U.K.

SIMPSON, RODNEY D.
UNIVERSITY OF NEW ENGLAND
DEPARTMENT OF ZOOLOGY
ARMIDALE NSW 2351, AUSTRALIA

SINGLETARY, ROBERT L.
UNIVERSITY OF BRIDGEPORT
BIOLOGY DEPARTMENT
BRIDGEPORT, CT 06601-2449

SKOLD, MATTIAS
KRISTINEBERG
MARINE RESEARCH STATION
FISKEBACKSKIL, S-450 34 SWEDEN

SLOAN, NORMAN A.
3249 W. 49TH AVENUE
VANCOUVER, B.C., V6N 3T5 CANADA

SMILEY, SCOTT
UNIVERSITY OF ALASKA
INSTITUTE OF ARCTIC BIOLOGY
FAIRBANKS, AK 99775

SMIRNOV, ALEXEI V.
MUSEUM NATIONAL D'HISTOIRE NATURELLE
BIOLOGIE INVERTEBRES MARINS
55, RUE DE BUFFON
PARIS, 75005 FRANCE

SMIRNOV, I. S.
ZOOLOGICAL INSTITUTE
ACADEMY OF SCIENCES
UNIVERSITetskAYA NAB., I
ST. PETERSBURG, 199034 RUSSIA

SMITH, ALBERT C.
1900 DEWITT STREET
PANAMA CITY, FL 32401

SMITH, ANDREW B.
THE NATURAL HISTORY MUSEUM
DEPARTMENT OF PALAEONTOLOGY
CROMWELL ROAD
LONDON, SW7 5BD ENGLAND, U.K.

SOLIS-MARIN, FRANCISCO A.
INST CIENC DEL MAR Y LIMNOL, UNAM
LAB DE ECOLOGIA DE EQUINODERMOS
APDO. POST. 70-305
MEXICO, D.F., MEXICO

SOLOVJEV, ANDREY N.
PALEONTOLOGICAL INSTITUTE
RUSSIAN ACADEMY OF SCIENCES
PROFSOYUSNAYA STR., 123
MOSCOW, 117647 RUSSIA

SOUTH, G. ROBIN
UNIVERSITY OF THE SOUTH PACIFIC
INSTITUTE OF MARINE RESOURCES
P.O. BOX 1168
SUVA, FIJI

SPENCER, LARRY T.
PLYMOUTH STATE COLLEGE
NATURAL SCIENCE DEPARTMENT
PLYMOUTH, NH 03264

SPRINKLE, JAMES
UNIVERSITY OF TEXAS
DEPT OF GEOLOGICAL SCIENCES
AUSTIN, TX 78712

STAMPANATO, SALVATORE
UNIVERSITE DE MONS-HAINAUT
LAB DE BIOLOGIE MARINE
19 AVE MAISTRIAU
7000 MONS, BELGIUM

STANCYK, STEPHEN E.
UNIVERSITY OF SOUTH CAROLINA
BELLE W. BARUCH INSTITUTE
COLUMBIA, SC 29208

STENKIL, MARGARETA
NATURAL HISTORY MUSEUM
BOX 406
MALMO S20124, SWEDEN

STEWART, BRIAN G.
UNIVERSITY OF OTAGO
DEPT MARINE SCIENCE
P.O. BOX 56
DUNEDIN, NEW ZEALAND

STICKLE JR., WILLIAM B.
LOUISIANA STATE UNIVERSITY
ZOOLOGY & PHYSIOLOGY DEPT.
BATON ROUGE, LA 70803

STOKES, ROBERT B.
KINGSTON UNIVERSITY
SCHOOL OF GEOLOGICAL SCIENCES
KINGSTON UPON THAMES
SURREY, KT1 2EE ENGLAND, U.K.

STRATHMANN, RICHARD R.
UNIVERSITY OF WASHINGTON
FRIDAY HARBOR LABORATORIES
620 UNIVERSITY ROAD
FRIDAY HARBOR, WA 98250

STUBBS, T.
UNIVERSITY OF ST. ANDREWS
GATTY MARINE LAB
FIFE, KY16 8L3 SCOTLAND, U.K.

STUMP, R.J.W.
JAMES COOK UNIVERSITY
ZOOLOGY DEPARTMENT
PO JCUNQ. TOWNSVILLE
QUEENSLAND 4811, AUSTRALIA

SUGIYAMA, MASAO
NAGOYA UNIVERSITY
MARINE BIOLOGICAL STATION
SUGASHIMA-CHO, TOBA-SHI
MIE-KEN 517, JAPAN

SULLIVAN, KATHLEEN M.
UNIVERSITY MIAMI
MARINE CONSERVATION SCIENCE
DEPT OF BIOLOGY, BOX 249118
CORAL GABLES, FL 33124

SUMRALL, COLIN D.
UNIVERSITY OF TEXAS
DEPARTMENT OF GEOLOGICAL SCI.
AUSTIN, TX 78712

SUTER, SHERMAN J.
SMITHSONIAN INSTITUTION
NAT. MUSEUM OF NATURAL HISTORY
DEPT OF PALEOBIOLOGY, MRC-121
WASHINGTON D.C. 20560

SUZUKI, NORIO
KANAZAWA UNIVERSITY
NOTO MARINE LABORATORY
OGI, UCHIURA
ISHIKAWA 927-05, JAPAN

TABLADO, ALEJANDRO
MUS. ARGENTINA CS. NATURALES
"BERNARDINO RIVADAVIA"
AVDA. ANGEL GALLARDO 470
1405 BUENOS AIRES, ARGENTINA

TAHERA, QASEEM
UNIVERSITY OF KARACHI
MARINE REFERENCE COLLECT. CTR.
CODE NO. 75270
KARACHI-32, PAKISTAN

TAJIKA, KEN-ICHI
NIHON UNIVERSITY
SCHOOL OF MEDICINE, OYAGUCHI
DEPARTMENT OF BIOLOGY
ITABASHI, TOKYO 173, JAPAN

TAKAHASHI, KEIICHI
INTERNATIONAL CHRISTIAN
UNIVERSITY, 3-10-2 OSAWA
DEPARTMENT OF BIOLOGY
MITAKA, TOKYO 181, JAPAN

TAKI, JYO
HOKKAIDO ABASHIRI
FISHERIES EXPERIMENTAL STATION
ABASHIRI, HOKKAIDO 099-31, JAPAN

TEGNER, MIA
SCRIPPS INST OF OCEANOGRAPHY
DEPARTMENT OF ZOOLOGY
PKO A001, LA JOLLA, CA 92093

TELFORD, MALCOLM
UNIVERSITY OF TORONTO
DEPARTMENT OF ZOOLOGY
TORONTO, ONTARIO, M5S 1A1 CANADA

TERRY, RICHARD E.
UNIVERSITY OF CINCINNATI
DEPARTMENT OF GEOLOGY
CINCINNATI, OH 45221

THANDAR, AHMED S.
UNIVERSITY OF DURBAN-WESTVILLE
DEPARTMENT OF ZOOLOGY
P/BAG X54001
DURBAN 4000, REPUBLIC OF SOUTH AFRICA

THIERRY, JACQUES
UNIVERSITE DE BOURGOGNE
CENTRE DES SCIENCES LA TERRE
6 BD GABRIEL
DIJON 21000, FRANCE

THIES, JENNIFER
7942 EMERALD BLUFF COURT
HOUSTON, TX 77095

THOMASSIN, BERNARD
CENT.D'OCEANOGRAPHIE MARSEILLE
STATION MARINE D'ENDOUME
H TRAVERSE LA BATTERIE LIONS
13007 MARSEILLE, FRANCE

THOMPSON, GEOFFREY B.
STATE POLLUTION CONTROL COMMIS
157 LIVERPOOL ST.
SYDNEY, NEW SOUTH WALES 2000, AUSTRALIA

THORSEN, MARIANNE S.
UNIVERSITY OF COPENHAGEN
MARINE BIOLOGICAL LABORATORY
STRANDPROMENADEN 5
DK-3000 HELSINGOR, DENMARK

TOMMASI, LUIZ ROBERTO
UNIVERSIDAD DE SAO PAULO
INSTITUTO OCEANOGRAFICO
CAIXA POSTAL NO 9075
SAO PAULO, S.P., BRAZIL

TURNER, RICHARD L.
FLORIDA INST. OF TECHNOLOGY
DEPT. OF BIOLOGICAL SCIENCES
150 W. UNIVERSITY BLVD.
MELBOURNE, FL 32901-6988

TYLER, PAUL
THE UNIVERSITY
DEPARTMENT OF OCEANOGRAPHY
SOUTHAMPTON, SO9 5NH ENGLAND, UK

UBAGHS, GEORGES J.
AVENUE BOIS LE COMTE 28
4140 SPRIMONT, BELGIUM

URBINA, MEDARDO BURGOS
UNIVERSIDAD DE CONCEPCION
INSTITUTO CENTRAL DE BIOLOGIA
CONCEPCION, CHILE

VJUTERZENKA, KAREN
INSTITUTE FOR POLAR ECOLOGY
WISCHHOFSTR. 1-3
GEB. 12
KIEL, D-24148, FED. REP. GERMANY

VADAS, ROBERT L.
UNIVERSITY OF MAINE
DEPT OF PLANT BIOLOGY
ORONO, ME 04469

VADET, ALAIN
67 BLVD EURVIN
62200 BOULOGNE SUR MER, FRANCE

VAIL, LYLE
LIZARD ISLAND RESEARCH STATION
PMB 37
CAIRNS, QUEENSLAND 4871, AUSTRALIA

VALENTINCIC, TINE
INSTITUTE OF BIOLOGY
ASKERCEVA 12
LJUBLJANA 61000, YUGOSLAVIA

VALENTINE, JOHN
UNIVERSITY OF ALABAMA
DAUPHIN ISLAND SEA LAB
BOX 369-370
DAUPHIN ISLAND, AL 36528

VAN DER HAM, RAYMOND
PIET HEINSTRAAT 6
2628 RK DELFT, THE NETHERLANDS

VANDEN SPIEGEL, DIDIER
UNIVERSITE DE MONS-HAINAUT
LAB DE BIOLOGIE MARINE
19 AVE MAISTRIAUX
7000 MONS, BELGIUM

VARAKSINA, GALINA S.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

VASKOVSKY, V. E.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

VEGA, JUAN TORRES
UNIVERSIDAD NACIONAL AUTONOMA
LABORATORIO ECOL. EQUINODERMOS
INST. CIENC. DEL MAR LIMNOLOG.
A.P 70-305, CP 04510, MEXICO DF

VELAQUE, MARC
UNIV. DES SCIENCES DE LUMINY
LABORATOIRE D'E.B.V.M.
CASE 901-70 RT LEON LACHAMP
13288 MARSEILLE CEDEX 9, FRANCE

VELARDE, RONALD
CITY OF SAN DIEGO
MARINE BIOLOGY LAB. M.S. 45
4077 NORTH HARBOR DR.
SAN DIEGO, CA 92101

VENTURA, RENATO
UNIVERSIDAD FEDERAL DO RJ.
DEPTO. DE BIOLOGIA MARINHA
BLOCO A, C.C.S. ILHA DO FUNDADO
RIO DE JANEIRO, RJ 21949, BRAZIL

VIKTOROVSKAYA, GALINA I.
PACIFIC RESEARCH INSTITUTE OF
FISHERIES OCEANOGR., LABORATOR
PHYSIOLOGY, 4 SHEVCHENKO ALLEY
VLADIVOSTOK, 690600 RUSSIA

VISTISEN, BODIL
UNIVERSITY OF COPENHAGEN
MARINE BIOLOGICAL LABORATORY
STRANDPROMENADEN 5
DK-3000 HELSINGOR, DENMARK

VIVIANI, CARLOS A.
UNIVERSIDAD DE LA SERENA
CAMPUS ENRIQUE MOLINA
LA SERENA, CHILE

VOOGT, PETER A.
UNIVERSITY OF UTRECHT
CHEMICAL ANIMAL PHYSIOLOGY
5 PRINCETON PLEIN
3584 CC UTRECHT, NETHERLANDS

VOSS, JOEACHIM
CHRISTIAN ALBRECHTS UNIV KIEL
INSTITUT FUR POLAROKOLOGIE
KIEL 2300, GERMANY

WAKELEY, CAROLYN
MFC ANALYTICAL SYSTEMS
2433 IMPALA DRIVE
CARLSBAD, CA 92008

WALENKAMP, J. H.C.
RIJKSMUSEUM VAN NAT. HISTORIE
RAAMSTEEG 3
LEIDEN 2311 PL, THE NETHERLANDS

WALKER, CHARLES W.
UNIVERSITY OF NEW HAMPSHIRE
DEPARTMENT OF ZOOLOGY
DURHAM, NH 03824

WAREN, ANDERS H.
RIKSMUSEET
BOX 50007, S-10405
STOCKHOLM, SWEDEN

WATERS, JOHNNY A.
WEST GEORGIA COLLEGE
DEPARTMENT OF GEOLOGY
CARROLLTON, GA 30118

WATTS, STEPHEN A.
UNIV OF ALABAMA AT BIRMINGHAM
DEPARTMENT OF BIOLOGY
UAB STATION
BIRMINGHAM, AL 35294

WEBER, WALTER
ZOOLOG. INSTITUTE, ANIMAL PHYSIO
UNIVERSITY OF COLOGNE
15 COLOGNE 41
WEYERTAL 119, GERMANY

WEBSTER, GARY D.
WASHINGTON STATE UNIVERSITY
DEPARTMENT OF GEOLOGY
PHYSICAL SCIENCE 1228
PULLMAN, WA 99164-2812

WIEDENMEYER, W.
INSTITUT FUR MEERESKUNDE
ABT. FISCHEREIBIOLOGIE
DUSTERNBROOKER WEG 20
KIEL, D-24105 GERMANY

WILKIE, IAIN C.
GLASGOW CALEDONIAN UNIV.
DEPT. OF BIOLOGICAL SCIENCES
GLASGOW G4 0BA, SCOTLAND, U.K.

WILLCOX, MARK
LIVERPOOL JOHN MOORES UNIV
BIOLOGICAL & EARTH SCIENCES
BYROM STREET
LIVERPOOL, L3 3AF ENGLAND, U.K.

WOODLEY, JEREMY D.
DISCOVERY BAY MARINE
LABORATORY,
P.O. BOX 35
DISCOVERY BAY, JAMAICA, WEST INDIES

WORHEIDE, GERT
FREIE UNIVERSITAT BERLIN
INSTITUT FUR PALAONTOLOGIE
MALTESER-STR 74-100, HAUS D
BERLIN, D-12249 GERMANY

WRAY, GREGORY A.
SUNY AT STONY BROOK
DEPT. OF ECOLOGY & EVOLUTION
STONY BROOK, NY 11794-5245

WRIGHT, C. W.
OLD RECTORY
SEABOROUGH, BEAMINSTER
DORSET DT8 304, ENGLAND, U.K.

YAKOVLEV, SERGHEY N.
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

YAKOVLEV, YURI
INSTITUTE OF MARINE BIOLOGY
PALCHEVSKY 17
VLADIVOSTOK, 690041 RUSSIA

YAMAGUCHI, MASASHI
UNIVERSITY OF THE RYUKYUS
DEPARTMENT OF MARINE SCIENCES
NISHIHARA
OKINAWA 903-01, JAPAN

YANAGISAWA, TOMIO
SAITAMA MEDICAL SCHOOL JUNIOR COLLEGE
MOROYAMA, IRUMA-GUN
SAITAMA 350-04, JAPAN

YOSHIKI, ISHIDA
4-21-2 KAMIIGUSA
SUGINAMI-KU
TOKYO 167, JAPAN

YOSHIDA, MASAO
USHIMADO MARINE LABORATORY
130-17 KASHINO, USHIMADO
OKAYAMA 701-43, JAPAN

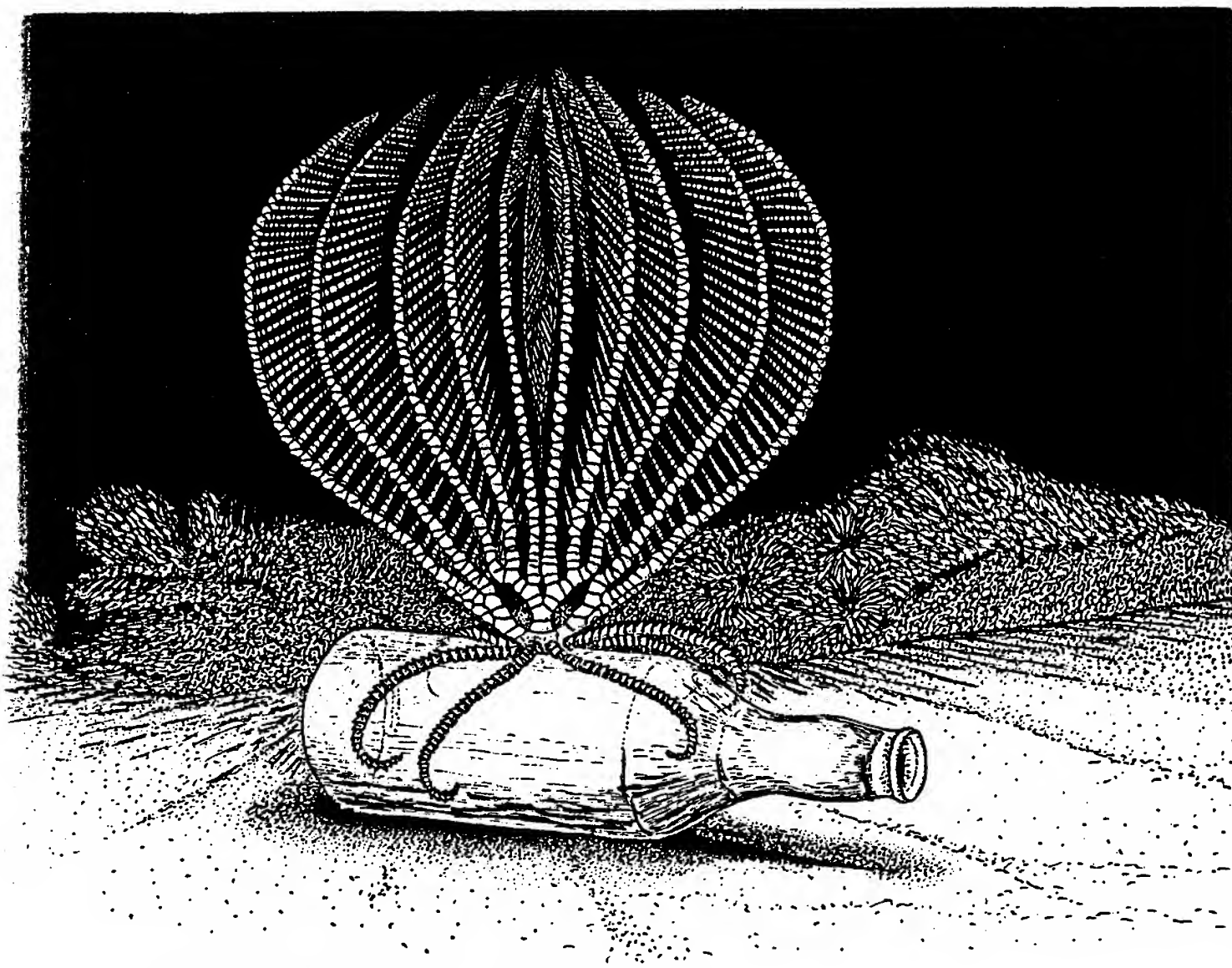
YOSHIZATO, KATSUTOSHI
TOKYO METROPOLITAN UNIVERSITY
DEPARTMENT OF BIOLOGY
SETAGAYA-KU, TOKYO, JAPAN

YOUNG, CRAIG
HARBOR BRANCH OCEANOGRAPHIC INSTITUTION, INC.
5600 OLD DIXIE HIGHWAY
FORT PIERCE, FL 34946

ZAGHBIB-TURKI, D.
DEPT. SCIENCES DE LA TERRE
FACULTE DES SCIENCES DE TUNIS
CAMPUS UNIVERSITAIRE
TUNIS 1060, TUNISIA

ZAVODNIK, DUSAN V.
CENTER MARINE RESEARCH ROVINJ
"RUDJER BOSKOVIC" INSTITUTE
ROVINJ 52210, CROATIA

ZEIDLER, WOLFGANG
SOUTH AUSTRALIAN MUSEUM
NORTH TERRACE
ADELAIDE, SOUTH AUSTRALIA 5000, AUSTRALIA



Happy New Year! *Václav Petr*

TELEPHONE - FAX - E-MAIL

AHEARN, CYNTHIA	202-786-2125	202-357-3043	mnhiv055@svm.si.edu
AMEZIANE-COMINARDI, NADIA	(33)1-40-79-30-95	(33)1-40-79-30-89	cominard@mnhn.fr
ANDACHT, TRACY M.	919-728-2111	919-728-2514	tandacht@acpub.duke.edu
ARISOLA, AMELIA T.	63-27-1009	63-27-1008	
ARNAUD, PATRICK M.	91 52.12.94		
ARONSON, RICHARD B.	205-861-2141		
AUSICH, WILLIAM L.	614-292-3353	614-292-1496	ausich.1@osu.edu
BAKER, ALAN	4 859-609	4 857-157	
BALSER, ELIZABETH J.	407-465-6630	407-461-8154	
BARKER, MICHAEL	3-479-7584	3-34781825	mfbarke@otago.ac.nz.
BARTSCH, ILSE	49 40 89693213	49 40 89693115	
BASCH, LARRY	408-459-4026	408-459-4882	lbasch@cats.ucsc.edu
BAUMILLER, TOMASZ K.	617-496-9157	617-496-5535	t-baumiller@harvard.edu
BEGBIE, KIRSTEN M.	0334-76161	0334-63443	kmb2@st-andrews.ac.uk
BELL, BRUCE M.	405-843-8408	405-843-8509	
BENTLEY, ANDREW	041-5042346		zlbac@zoo.upe.ac.za
BERENTS, PENELOPE B.	61-2-339-8111	61-2-360-4350	pennyb@amsg.austmus.oz.au
BERGER, JACQUES		416-978-3521	
BIRENHEIDE, RUDIGER	81-3-5734-2656	81-3-3748-3017	tmotokaw@cc.titech.ac.jp
BIRKELAND, CHARLES E.	671-734-2421	671-734-6767	chaz@uog.pacific.edu
BLACK, W. ROBERT	619-380-2232	619-380-1029	rblack@uniwa.uwa.edu.au
BLAKE, DANIEL B.	217-333-3833	217-244-4996	blake@firefly.geology.uiu
BOCKELIE, JOHAN F.	47-22-738100	47-22-739070	
BORZONE, CARLOS A.	55-041-455-1333	55-041-223-7266	capborza@brufpr
BOSCH, ISIDRO	407-465-2400	407-465-2446	
BOUDOURESQUE, CHARLES F.	33-91 26 91 30	33-91 41 12 65	
BRETON, GERARD	33 35 41 37 28	33 35 42 12 40	
BREWIN, PAUL E.	3-479-8306		marinesci@otago.ac.nz
BROWER, JAMES	315-443-4119		
BUITRON-SANCHEZ, BLANCA E.	525 622 42 97	525 550 66 44	unamvm1.dgsca.unam.mx
BURKE, ROBERT	604-721-710	604-721-8653	
BUSSARAWIT, SOMCHAI	166-76-391128	166-76-391127	
BUSTOS, EDUARDO		56 65-259-995	
BYRNE, MARIA	61-2-692-2436	61-2-692-2813	mbyrne@anatomy.su.oz.au
CAMERON, R. ANDREW	818-395-8421	818-793-3047	acameron@mirsky.caltech.e
CAMPBELL, ANDREW	71 775 3298	81 983 0973	
CAMPBELL, DAVID B.	609-895-5418	609-895-5782	
CAREY JR, ANDREW G.	503-754-3504		

CASTILLO, JUAN CAROLOS	56-2-222-4561	56-2-222-5515	
CHEN, CHANG-PO	886-785-8059		zocp@twnas886.bitnet
CHIA, FU-SHIANG	403-432-3499		
COBB, JAMES L.S.		334 76161	
CONAND, CHANTAL	19262-294545	19262-290090	conand@iremia.fr
DAFNI, JACOB	972-7-332446	972-7-334837	
DAVID, BRUNO	80-39-63-71	80-39-50-66	bdavid@satie-u-bourgogne.
DE RIDDER, CHANTAL	32-2-6502970	32-2-6502796	
DEARBORN, JOHN H.	207-581-2552		
DIEHL, WALTER J.	601-325-7576	601-325-7939	wjdiehl@ra.msstate.edu
DOBSON, WILLIAM E.	704-262-2668	704-262-2127	dobsonwe@conrad.appstate.
DOLMATOV, IGOR Y.	4232-311-178	4232-310-900	faribm@visenet.marine.su
DONOVAN, STEPHEN	809-927-2728	809-927-1640	
DROZDOV, ANATOLY L.		4232-310-900	faribm@visenet.marine.su
DRUMMOND, ANNE E.	27-21-6503290	27-21-6503295	
DUBOIS, PHILIPPE		32-2-642-25-17	phdubois@ulb.ac.be
EBERT, THOMAS A.	419-594-6767		
ECKELBARGER, KEVIN	207-563-3146	207-563-3119	
EECKHAUT, IGOR	32-65-373441	32-65-373434	
ELISEIKINA, MARINA G.	4232-311-178	4232-310-900	faribm@visenet.marine.su
ELLERS, OLAF	916-752-1449		
EMLET, RICHARD B.	503-888-2581	503-888-3250	remlet@oimb.uoregon.edu
EMSON, ROLAND	71-836-5454	71-937-5396	
ETNIER, SHELLEY		919-684-6168	
ETTENSON, FRANK R.	606-257-1401	606-258-1938	geofre@ukcc.uky.edu
EVDOKIMOV, VLADIMIR V.	25 78 33	25 77 83	
EYLER, JOHN P.	919-220-5429	919-220-5575	
FANKBONER, PETER V.	604-291-4475		
FARMANFARMAIAN, ALLAHVERDI	908-463-8200	908-932-5870	
FELDMAN, ABBY L.	353-091-24411	353-091-25005	9390349p@bodkin.vcg.ie
FENAU, LUCIENNE	93 76 66 13	93 76 38 34	
FERAL, JEAN-PIERRE	33-6888-7318	33-6888-1699	
FERGUSON, JOHN C.	813-867-1166		
FISHELSON, LEV	972-3-6409812	972-3-6409403	zool@taunos
FLAMMANG, PATRICK	32-65-373441	32-65-373434	
FONTAINE, ARTHUR R.	604-721-7131	604-721-7120	
FOURNIER, JUDITH A.	613-954-2655	613-954-6439	
FOX, DAVID J.	615-974-2978	615-974-0978	
FRANZEN-BENGTSON, CHRISTINA	46-8-666-4177	46-8-666-4184	
FUJITA, TOSHIHIKO	81-3-3364-2311	81-3-3364-2316	

FUKUYAMA, ALLAN K.	206-745-3349	206-745-3349	
GAGE, JOHN D.	631-62244	631-65518	
GAGNON, JEAN-MARC			jmgagnon@iml1.iml.dfo.ca
GENTIL, FRANCK	98 69.72.30		
GIUDICE, GIOVANNI	91-616-26-322	91-616-56-65	
GLUCHOWSKI, EDWARD L.	48-32-667271 (433)	48-32-664351	
GLYNN, PETER W.	305-361-4151		
GOLDBERG, ARTHUR S.	516-287-8406	516-287-4094	
GOODING, RICHARD U.	809-427-9436		
GRABOWSKY, GAIL L.	808-539-7309		
GREENSTEIN, BENJAMIN J.	413-585-3947	413-585-3786	bgreenst@science.smith.ed
GUILLE, ALAIN	68 88 00 40	68 88 16 99	
GUILLOU, MONIQUE	33 98 31 62 73	33 98 31 63 11	
GUISADO ARANGUIZ, CHITA B.		51 311287	
GUTT, JULIAN	49-471-4831333	49-471-4831149	
HAMEL, JEAN-FRANCOIS	418-724-1770	418-724-1842	jf_hamel@uqar.quebec.ca
HARROLD, CHRISTOPHER	408-649-6466		
HARTSOCK, FRANKLIN B.	907-487-4961	907-487-4960	
HENDLER, GORDON	213-744-6391	213-746-2999	
HERRERA, JOAN			herrera@zoo.ufl.edu
HILL, ROBERT B.	401-792-2372		
HIMMELMAN, JOHN H.	418-656-5230	418-656-2339	
HODGSON, ALAN N.	0461-318526	0461-24377	zoah@giraffe.ru.ac.za
HOLTERHOFF, PETER F.	602-621-6024	602-621-2672	holterho@ccit.arizona.edu
HOOPER, ROBERT G.	709-737-7494	709-737-3018	rhooper@kean.ucs.mun.ca
HOPKINS, THOMAS S.	205-861-2141	205-861-4646	
HOROWITZ, ALAN STANLEY	812-855-3536	812-855-7899	horowitz@ucs.indiana.edu
HOSHI, MOTONORI	81-45-923-0368	81-45-923-0368	mhoshi@nc.titech.ac.jp
HOTCHKISS, FREDERICK H.C.	617-899-2719	617-899-1552	
IRIMURA, SEIICHI	81-3-3727-4153		
ISAEVA, VALERIA V.		4232-310-900	faribm@visenet.marine.su
JABLONSKI, DAVID	312-702-8163	312-702-9505	
JAECKLE, WILLIAM B.	407-465-6630	407-461-8154	
JAMES, DANIEL B.	91-20102		
JANIES, DANIEL			daj@zoo.ufl.edu
JENSEN, MARGIT	31-35-41-11	31-39-81-55	
JOHNSEN, SONKE	919-962-5017	919-962-1625	sonkejo@uncmvs.oit.unc.ed
KASYANOV, VLADIMIR L.		4232-310-900	farbim@visenet.marine.su
KEEGAN, BRENDAN F.	91-24411	91-25700	
KLINGER, THOMAS S.	717-389-4118	717-389-2094	klin@bf486.bloomu.edu

KNOTT, K. EMILY	205-348-7709		
KOBAYASHI, NAOMASA	82-228-0386		
KOLATA, DENNIS R.			kolata@geoserv.isgs.uiuc.
KRISTAN-TOLLMANN, EDITH M.K.	47-25-184		
KURIHARA, TAKEO	81-75-753-6468	81-75-753-6229	
LAMBERT, PHILIP	604-387-6513	604-387-5360	plambert@galaxy.gov.bc.ca
LANE, N. GARY			lane@ucs.indiana.edu
LARRAIN, ALBERTO P.	56-234985	56-240280	
LAWRENCE, JOHN M.	813-974-3250	813-974-3263	lawr@chuma.cas.usf.edu
LE MENN, JEAN	98-01-61-89	98-01-66-20	
LeCLAIR, ELIZABETH E.	312-702-7506		lecl@midway.uchicago.edu
LEIBSON, NINA L.		4232-310-900	faribm@visenet.marine.su
LESSER, MICHAEL P.	603-862-2100	603-862-3784	
LESSIOS, HARIS A.	507-28-4304	507-28-0516	
LEVERONE, JAY R.	813-388-4441	813-388-4312	
LEVIN, VALERY S.			service@post.kamchatka.su
LEVITAN, DONALD R.	904-644-2524	904-644-9829	levitan@bio.fsu.edu
LIAO, YULIN	2879062-271	86-532-2870882	
LITVINOVA, NINA M.	129-21-18	(095) 124-59-83	
LORDSON, JINBERT	91-20102		
LOVELY, ERIC C.	603-743-4585		ecl@christa.unh.edu
LUBCHENCO, JANE			lubchenj@bcc.orst.edu
LUCAS, JOHN	77-814111	77-796371	
MACURDA, JR., D.BRADFORD	713-781-6881	713-781-2998	
MAH, CHRISTOPHER			cmah@sfsuvax1.sfsu.edu
MANCHENKO, GENNADY P.		4232-310-900	faribm@visenet.marine.su
MAPLES, CHRISTOPHER G.			maples@ukanvax.bitnet
MARCOS-DIEGO, CONCEPCION	34-68-833000	34-68-363963	
MARTIN, RICHARD B.	61-2-325-222	61-2-325-000	martin@ml.csiro.au
MATERIA, CHRISTINE J.	002-33-6357	002-33-3477	chrismat@parks.parks.tas.
MATTOS-SEGOVIA, ELIO	56-057-447070	56-057-441009	
McCLINTOCK, JAMES B.	205-934-8308		biof004@uabdpdpo.dpo.uab.ed
McEDWARD, LARRY	904-932-8738	904-392-3704	lmced@zoo.ufl.edu
McKENZIE, J. DOUGLAS	0631-62244	0631-65518	s-jm@uk.ac.nsm.va
McKNIGHT, DONALD	4-386-1189	4-386-2153	
MEDEIROS-BERGEN, DOT E.	603-862-2100		d-medeiros@unhh.unh.edu
MEIJER, LAURENT	98.29.23.39	98.29.23.42	
MENGE, BRUCE A.		503-737-0501	mengeb@bcc.orst.edu
MESSING, CHARLES G.	305-920-1909	305-947-8559	messaging@polaris.nova.edu
MEYER, DAVID L.	512-556-6931		meyer@ucbeh.san.uc.edu

MLADENOV, PHILIP V.	64-3-4798306	64-3-4798336	mladenov@otago.ac.nz
MOOI, RICHARD	415-750-7080	415-750-7090	
MUNAR-BERNAT, JAIME	292009		
MUNK, ERIC J.	907-487-4962	907-487-4960	
NAIDENKO, TAMARA K.	4232-311-143	4232-310-900	faribm@visenet.iasnet.com
NAKAMURA, RAYMOND K.	416-978-4843	416-978-8532	nak@zoo.utoronto.ca
NAKANO, EIZO	81-5617-2-4673	81-5617-2-4673	
NEBELSICK, JAMES H.	49-7071-29-4039	49-7071-29-6990	
NICHOLS, DAVID	392-263263	392-263700	biology@exeter.ac.uk
NOJIMA, S.	969-35-000	969-35-2413	
NORRIS, DANIEL R.	671-472-3002	671-472-3002	dnorris@uog.pacific.edu
O'LOUGHLIN, P. MARK	347-4211		
OJEDA, F. PATRICIO	56-2-222-4516	56-2-222-5515	
OJI, TATSUO	81-3-3812-2111	81-3-3815-9490	oji@tsunami.geol.s.u-toky
PABIAN, ROGER K.	402-472-7564	402-472-2410	RPABIAN@UNLINFO.UNL.EDU
PARDO, ROBERTO A.	923-393243	57-23-392440	
PARSLEY, RONALD	504-865-5918		
PAULS, SHEILA MARQUES	58-2-662-7895	58-2-693-1653	gpereira@dino.conicit.ve
PAWSON, DAVID L.	202-786-2127	202-357-3043	mnhiv070@sivm.si.edu
PEARSE, JOHN S.	408-459-245	408-459-2882	
PENCHASZADEH, PABLO E.	58-2-906-3052	58-2-906-3064	ppenchas@shaddam.usb.re
PEREZ-RUZAF, ANGEL	34-68-833000	34-68-363963	angelpr@fcu.um.es
PHILIPPE, MICHAEL	7-893-22-44		
PIEPENBURG, DIETER	49-431-7208764	49-431-7208720	npf32@rz.uni-kiel.d400.de
POLSON, EMMA		813-974-3250	emma@chuma.cas.usf.edu
PROKOP, RUDOLF JAN	42-2-24230485	42-2-24226488	
PROPP, M. V.	4232-310-912	4232-310-900	faribm@visenet.marine.su
REGIS, MARIE-BERTHE	91.28.84.41	91.28.80.30	
REGNELL, GERHARD	46-121-475	46-121-477	
ROCCATAGLIATA, ALEJANDRO J.		541-782-0529	atina@quimor.postmaster
ROGERS-BENNETT, LAURA	707-875-2211	707-875-2043	lkrogersbennett@ucdavis.e
ROSE, EDWARD P.F.	784-434455	784-71780	
ROTMAN, HELEN CLARK	64-3861189	64-3862153	
ROUX, MICHEL	26.5.33.96		
SCALLY, KEVIN	64-3640-250	64-3640-246	
SCHELTEMA, RUDOLF S.	508-548-1400		
SCHUETZ, ALLEN W.	410-955-3117	410-955-0792	
SEWELL, MARY			sewell@uctvax.uct.ac.za
SHICK, MALCOLM	207-581-0146		shick@maine.bitnet
SHIRLEY, THOMAS C.	907-465-6449	907-465-6447	jftcs@acad1.alaska.edu

SIBUET, MYRIAM	98-22-43-03	98-22-45-47	msibuet@ifremer.fr
SINGLETARY, ROBERT L.	203-576-4270		
SKOLD, MATTIAS	46-523-18528	46-523-18502	m.skold@kmf.gu.se
SMILEY, SCOTT	907-474-7655	907-474-6967	
SMIRNOV, I. S.	812-218-13-11	812-218-29-41	zisp.pm@pcsti.spb.su
SMITH, ALBERT C.	904-872-4455		
SMITH, ANDREW B.	071-938-8925	071-938-9277	abs@nhm.ic.ac.uk
SOLIS-MARIN, FRANCISCO A.	52-622-5810		
SPENCER, LARRY T.			lts@oz.plymouth.edu
SPRINKLE, JAMES	512-471-4264	512-471-9425	
STAMPANATO, SALVATORE	32-65-373439	32-65-373434	
STANCYK, STEPHEN E.	803-777-3944	803-777-3935	stancyk@univscvm.csd.scar
STENKIL, MARGARETA	46-4-0344414	46-4-0344364	
STEWART, BRIAN G.	64-3-4798306	64-3-4798336	
STICKLE JR., WILLIAM B.	504-388-1739	504-388-1763	zostic@lsuvm.sncc.edu
STRATHMANN, RICHARD R.			strath@fhl.washington.edu
SUTER, SHERMAN	202-633-9322		nhmpb061@sivm.si.edu
SUZUKI, NORIO	768-74-1151	768-74-1644	
TABLADO, ALEJANDRO	54-1-982-1154	54-1-982-5243	aletab@muanbe.gov.ar
TAKAHASHI, KEIICHI	422-33-3349	422-33-1449	keiichi@icu.ac.jp
TELFORD, MALCOLM	416-978-4843		gmt@zoo.toronto.edu
TURNER, RICHARD L.	407-768-8000	407-984-8461	turner@fit.edu
TYLER, PAUL	70-3-592557	70-3-593939	
UBAGHS, GEORGES J.	41-68-64-40		
V.JUTERZENKA, KAREN	49-431-7208766	49-431-7208720	npf32@rz.uni-kiel.d4000.d
VADAS, ROBERT L.	207-581-2970	207-581-2969	vadas@maine.edu
VADET, ALAIN	21318713		
VALENTINE, JOHN	205-861-2141	205-861-4646	
VANDENSPiegel, DIDIER	32-65-373433	32-65-373434	
VARAKSINA, GALINA S.		4232-310-900	faribm@visenet.marine.su
VASKOVSKY, V. E.		4232-310-900	vvas@imb.marine.su
VELARDE, RONALD	619-692-4903	619-692-4902	
VENTURA, RENATO	55-021-2807993		ventura@ufrj.bitnet
WAREN, ANDERS H.	46-8-6664086	46-8-6664125	
WATERS, JOHNNY A.			jwaters@uga.bitnet
WATTS, STEPHEN A.	205-934-1045		
WEBSTER, GARY D.	509-335-4369	509-335-7816	
WILLCOX, MARK	051-231-2121	051-298-1014	besmwillcox@vax.livjm.ac.
WORHEIDE, GERT	49-30-7792284	49-30-7762070	
WRAY, GREGORY A.	516-632-8506	516-632-7626	wraygreg@sbbiorm.bitnet

YAKOVLEV, SERGHEY N.		4232-310-900	faribm@visenet.marine.su
YAKOVLEV, YURI		4232-310-900	faribm@visenet.marine.su
YAMAGUCHI, MASASHI	81-98-895-2221	81-98-895-2414	
ZAGHBIB-TURKI, D.	216-1-512-600	216-1-500-666	
ZAVODNIK, DUSAN V.	385-52-811-544	385-52-813-496	
ZEIDLER, WOLFGANG	08-2077491	618-2077222	

CURRENT RESEARCH

ANDACHT, TRACY M.

studying the mechanism of dorsoventral polarity disruption by nickel chloride in sea urchin embryos

AUSICH, WILLIAM L.

Paleozoic crinoids

BALSER, ELIZABETH J.

studying the development of the gonad in holothuroid echinoderms (postdoctoral fellowship at Smithsonian Marine Station at Link Port, Ft. Pierce, Fla. - beginning Feb. 1994)

BARTSCH, ILSE

ophiuroid associates, endo- and ectoparasites

BAUMILLER, TOMASZ K.

ecology and functional morphology of recent isocrinids; taphonomy of arms and stalks of articulates and advanced cladids vs. other Paleozoic taxa; diversity of Permian and Triassic crinoids and effects of the P/T extinction; patterns of turnover and extinction of Paleozoic crinoids; ecology of Seirocrinus; borings in Paleozoic pelmatozoans

BEGBIE, KIRSTEN M.

studies on the hyponeural nervous system of the brittlestar, Ophiura ophiura

BENTLEY, ANDREW

biology of the sand dollar, Echinodiscus bisperforatus

BERENTS, PENELOPE B.

collection manager of marine invertebrates at the Australian Museum

BIRENHEIDE, RUDIGER

morphology, physiology and biomechanics of crinoids

BLAKE, DANIEL B.

Texas Cretaceous asteroids; Upper Paleozoic asteroids

BOCKELIE, JOHAN F.

Heliocrinitids (cystoids) from Scandanavia and the Bathic; taxonomy, functional morphology and palaeoecology

BORZONE, CARLOS A.

bioecological study of Mellita quinquiesperforata and Encope emarginata in beaches of Parana's state; relation between morphodynamics and benthic macrofaunal distribution in sandy beaches of Parana's state; program management for the oceanic islands of Parana's state

BOUDOURESQUE, CHARLES F.

feeding behaviour of Mediterranean sea urchins; population dynamics and structure of Mediterranean echinoderms

BRETON, GERARD

studying Mesozoic asteroid paleontology

BROWER, JAMES

taxonomy, paleoautecology, paleosynecology, ontogeny and phylogeny of Ordovician crinoids from the northern part of the midcontinent; comparative ontogeny of Ordovician and Mississippian crinoids

BUITRON-SANCHEZ, BLANCA E.

Cenozoic echinoderms (Stellerioidea and echinoidea) from Baja California, Mexico

BUSSARAWIT, SOMCHAI

Study of the echinoderms from the Andaman Sea of Thailand

BYRNE, MARIA

evolution of direct development of Australian seastars in the genus Patiriella

CAMERON, R. ANDREW

sea urchin cell lineage; gene activity during embryonic and larval development; population genetics of sea urchins; sea urchin inbred lines; signal transduction during development

CAMPBELL, ANDREW

structure and function of pedicellaria in asteroids and echinoids; zoogeography of Indian Ocean echinoderms

CANDIA-CARNEVAL, M. DANIELA

functional morphology of musculo-skeletal systems in echinoids and ophiuroids; arm regeneration in crinoids

CONAND, CHANTAL

echinoderm influences on coral reefs in La Reunion, as part of the program on functioning, degradations and regeneration of the reefs in La Reunion; sea cucumber exploitations

- CUTRESS, BERTHA M.
changes in dermal ossicles during somatic growth in Caribbean littoral holothuroidea, Order Aspidochirotida (MS submitted to Bull. Mar. Sci.); deep-sea Holothuroidea of Puerto Rico (MS in preparation).
- DAFNI, JACOB
echinoid growth
- DE RIDDER, CHANTAL
symbioses between bacteria and spatangoid echinoids
- DEBENHAM, PATTY
population genetics of the red sea urchin Strongylocentrotus franciscanus
- DIEHL, WALTER J.
effects of environmental stress on multilocus heterozygosity-growth relationships in invertebrates
- DOBSON, WILLIAM E.
population biology of *Ophiura sarsi* on continental slope off North Carolina; use of skeletal growth bands in ophiuroid ossicles as biological markers for sublethal predation and population ecology experiments
- DOLMATOV, IGOR Y.
regeneration mechanisms and their changes during individual development of echinoderms
- ELISEIKINA, MARINA G.
physiological and reparative regeneration of echinoderm internal organs
- ETNIER, SHELLEY
comatulid crinoids
- FELDMAN, ABBY L.
studying echinoderm larvae based on hauls taken from sites on the west coast of Ireland to monitor seasonality and presence of echinoderm larvae in the water column and linking this with lab studies on morphological variation of larvae of Luidia ciliaris/sarsi with different food conditions (MSc thesis)
- FOX, DAVID J.
can genetic algorithms be used to position a mechanical brittlestar arm?

FUKUYAMA, ALLAN K.

looking at recovery of intertidal invertebrates in Prince William Sound, Alaska following the 1989 Exxon Valdez oil spill and am particularly interested in molluscan and echinoderm assemblages and the contrast in recovery patterns between areas that were treated with hot-water, high pressure treatment with areas that were oiled and untreated

GLUCHOWSKI, EDWARD L.

Genus Haplocrinites (Inadunata) from the Devonian of Poland

GOLDBERG, ARTHUR S.

investigating antiarthritic properties of echinoderms

GOODING, RICHARD U.

animals associated with Caribbean diadematids; animals associated with diadematid echinoids, world

GRABOWSKY, GAIL L.

examining the population genetics of sea urchins in the genus Echinometra throughout the tropical Pacific (sequencing mtDNA, actin and bindin genes for all individuals)- with S. Palumbi at Univ. of Hawaii

GREENSTEIN, BENJAMIN J.

taphonomy of crown-of-thorns starfish; comparative taphonomy of Caribbean reefs; mode of formation of Pliocene shell beds

GUILLOU, MONIQUE

population dynamics of sea urchins; study of the morphological and physiological changes in sea urchin population as a response to environmental stress (Sphaerechinus granularis)

HADEL, VALERIA FLORA

respiratory metabolism of Chiridota rotifera (small holothuroid found in beaches of coarse sand)

HAMZA HASSAN, MOHAMED

ecology and biology of echinoderms from Gulf of Suez - Red Sea

HARTSOCK, FRANKLIN B.

biology of Asterias amurensis in the eastern Bering Sea and the Gulf of Alaska; attempt to age sea stars by madreporites, using Asterias amurensis and Leptasterias hexactis; cooperative study with John Lawrence on the incidence of missing arms of various species of sea stars

HESS, HANS K.

writing a book on fossil crinoids, concentrating on assemblages (co-authors: Carlton E. Brett and Michael J. Simms), to be published by Cambridge University Press; also researching Mesozoic starfish

HODGSON, ALAN N.

reproduction of southern African echinoderms; feeding biology of south African holothurians

HOLTERHOFF, PETER F.

paleoautecology and paleocommunity ecology of Late Paleozoic crinoids; paleoecology and systematics of the Catacrinidae; paleoecology and systematics of the Ampelocrinacea; dynamics of the Late Permian crinoid extinctions and origin of the earliest Triassic articulates

HOOVER, ROBERT G.

ecology of Strongylocentrotus drobachiensis

HOROWITZ, ALAN STANLEY

bibliography of the Blastoidea (with J. Waters)

HOSHI, MOTONORI

egg-jelly components responsible for the induction of acrosome reaction in starfish; signal transduction in starfish oocytes; glycosphingolipids of sea urchins and starfish

HOTCHKISS, FREDERICK H.C.

larval homeomorphism, Loven's law and adult ray homologies in echinoids, ophiuroids and edrioasteroids; isolated ophiuroid vertebrae and ossicles from Devonian, Bohemia (with Petr & Prokop); Paleozoic ophiuroid morphology & evolution; teratology of sea stars; tetramerism/hexamerism in echinoids and stellerioidea; relation of larval axis to adult axis symmetry

IRIMURA, SEIICHI

taxonomic studies of Japanese ophiurans; taxonomic significance on ossicles of stomach wall of ophiurans

IVY, W. GRISILDA

seed production and sea ranching of sea cucumbers

JABLONSKI, DAVID

onshore-offshore and latitudinal patterns in the origins of higher taxa, and their subsequent shifts in environmental and latitudinal distribution; studying post-Paleozoic echinoids and stalked crinoids; studying mainly molluscan but some echinoid mass extinction and recovery patterns, especially at the Cretaceous-Tertiary boundary

- JAECKLE, WILLIAM B.
Functional morphology of somatocoels in planktotrophic echinoderm larvae; levels of nutritional integration in echinoderm larvae
- JAMES, DANIEL B.
seed production and sea ranching of sea cucumbers
- JELL, PETER A.
Australian fossil echinoderms - Cambrian to Tertiary (excluding Tertiary echinoids) particularly, 1. Silurian & Devonian crinoids & asteroids, 2. Permian crinoids, 3. Carboniferous crinoids
- KLINGER, THOMAS S.
isolation and characterization of digestive enzymes from temperate, subtropical, and Antarctic echinoderms
- KOBAYASHI, NAOMASA
marine pollution bioassay by using sea urchin eggs
- KRISTAN-TOLLMAN, EDITH M.K.
Triassic crinoids
- KURIHARA, TAKEO
distribution of starfishes
- LAMBERT, PHILIP
taxonomy of west coast sea cucumbers; describing new species DNA analysis of holothuroids
- LAWRENCE, JOHN M.
characteristics of arm regeneration in starfish; comparative nutrition of sea urchins
- LE MENN, JEAN
Paleozoic crinoids western-Europe, Africa
- LeCLAIR, ELIZABETH E.
ophiuroid arm skeletal morphology and biomechanics
- LEVERONE, JAY R.
reproductive cycles of Astropecten and Luidia in lower Tampa Bay
- LEVITAN, DONALD R.
ecological and evolutionary consequences of sperm limitation in echinoderms; echinoid grazing pressure in the Caribbean
- LIAO, YULIN
lesser known and new taxa of dendrochirote holothurians from China

- LITVINOVA, NINA M.
investigation on morphological and functional structures of the brittlestar's arms; revision of the genus Ophiomyces (Ophihelinae)
- LORDSON, JINBERT
seed production and sea ranching of sea cucumbers
- MAIER, MARTA
studying asterosaponius
- MARCOS-DIEGO, CONCEPCION
study of benthic fauna and flora from the southern of the Livingston Island (South Shetland, Antarctica).
- MARSH, LOISETTE M.
revision of Nardoa and Gomophia (Asteroidea: Ophidiasteridae) - with F.W.E. Rowe; echinoderms of the northwest shelf of Western Australia
- MATERIA, CHRISTINE J.
the distribution and abundance of asteroids in Tasmania (funded through Australian Heritage Commission); investigation into the endemic Tasmanian seastar Marginaster littoralis (funded through Australian Nature Conservation Agency).
- MATTOS-SEGOVIA, ELIO
the assessment of bioinducers of the settlement in larvae of sea urchin Loxechinus albus
- MCKENZIE, J. DOUGLAS
subcuticular bacteria in echinoderms; antifouling mechanisms of echinoderms
- MEDEIROS-BERGEN, DOT E.
molecular identification of echinoderm larvae transport, dispersal and small scale hydrodynamics of sea cucumber larvae
- MEIJER, LAURENT
cell division cycle control using starfish oocytes and sea urchin eggs; anti-mitotic drugs discovery using purified kinase from starfish oocytes
- MESSING, CHARLES G.
ecology and taphonomy of Bahamian stalked crinoids (Isocrinida), including growth rates, behavior and distributional controls; ecology, zoogeography and systematics of tropical Indo-West Pacific comatulids

- MIRONOV, ALEXANDER
taxonomy and biogeographic history of recent holasteroid
echinoids
- MLADENOV, PHILIP V.
ecology and population genetics of asexual echinoderms;
reproductive ecology and population genetics of the New Zealand
sea urchin, Evechinus chloroticus; reproductive biology and
ecology of the euryalinid snake star, Astrobrachion
constrictum (with B. Stewart); comparative reproductive biology
of South Pacific ophiuroids (with R. Lan); ecology and
reproduction of Holothuria atra in Fiji (with J. Seeto);
reproductive biology of the New Zealand comatulid crinoid,
Oxycomanthus plectrophorum (with D. Nichol)
- MUKAI, HIROSHI
ecosystem study in tropical and boreal seagrass beds;
bioturbation and restructural effects on material flow at
interface of sea floor
- MUNK, ERIC J.
growth/recruitment with green urchins
- NAKAMURA, RAYMOND K.
hydrodynamics and morphometric variation in the Pacific sand
dollar Dendraster excentricus
- NAKANO, EIZO
extracellular matrix in the sea urchin embryo
- NEBELSICK, JAMES H.
taphonomy of Red Sea echinoids; paleobiogeography of Miocene
echinoids
- NESTLER, HELMUT
Cretaceous echinoids
- NEUMANN, CHRISTIAN
functional morphology and ecology of some Toxasterida from the
Middle Cretaceous (Albium-Cenomanium) of Spain; traces or
predation of fossil and recent sea urchins
- NISHIHARA, MORITAKA
population studies on Echinometra mathaei and Archaster typicus
- O'CONNOR, BRENDAN D.S.
ophiuroid population structure and ecology
- OJI, TATSUO
evolutionary paleontology of Crinoidea

- PABIAN, ROGER K.
Late Pennsylvanian crinoids, systematics, paleoecology, biostratigraphy
- PARDO, ROBERTO A.
ecology and population dynamics of echinoderms (particularly echinoids and ophiuroids) - currently, population dynamics of sand dollars
- PARMA, GRACIELA
fossil echinoids
- PAULS, SHEILA MARQUES
inventory of species and bibliography of the echinoderms from Venezuela, South America
- PENCHASZADEH, PABLO E.
ecology of sand dollars (Mellita spp.); trophic ecology of asteroids
- PEREZ-RUZAFIA, ANGEL
wetlands and coastal lagoons of Galapagos Islands (Ecuador) - basis for its protection and management; Iberic fauna; study of benthic fauna and flora from the southern of Livingston Island (South Shetland, Antarctica); design of new algorithms for the primary productivity and water quality prediction in coastal zones using remote sensing techniques.
- PIEPENBURG, DIETER
ecology of brittle stars in Eurasian Arctic seas
- PROKOP, RUDOLF JAN
new implications for palaeobiology of float-bearing crinoids from the Bohemian Upper Silurian - Lower Devonian; genus Pygmaeocrinus Bouska (Crinoidea) in the Devonian of Barrandian (Czech Republic) with Dr. V. Petr
- ROCCATAGLIATA, ALEJANDRO J.
chemistry of physiologically active saponins of starfishes and sea cucumbers in the South Atlantic Ocean
- ROGERS-BENNETT, LAURA
culturing of larval red sea urchins for experimental outplanting in northern California (California Dept. Fish & Game); growth studies of red sea urchins in northern California
- ROSE, EDWARD P.F.
Jurassic irregular echinoids; Cenozoic holoctypoid echinoid Echinoneus

- ROWE, FRANK
Indo-west-Pacific echinoderms and their systematics and zoogeography
- SCALLY, KEVIN
tooth form function and evolution of invertebrate dental systems, especially tooth sharpening behaviour (thegosis)
- SCHELTEMA, RUDOLF S.
long distance dispersal of teleplanic larvae and the relevance of such transport to gene flow and biogeography of tropical invertebrate species
- SCHOPPE, SABINE
working with Quinones on ophiuroids of Providencia Island, Caribbean Colombia; taxonomy, reproduction and ecology of ophiuroids; association of echinoderms with other taxa
- SCHUETZ, ALLEN W.
development of a new model for multiparameter analyses of perturbations of gametic and embryonic processes
- SHEPHERD, SCORESBY A.
management of echinoderm fisheries
- SIBUET, MYRIAM
taxonomy and ecology of deep sea echinoderms
- SINGLETARY, ROBERT L.
role of Arbacia punctulata in the bottom community of Long Island Sound
- SKOLD, MATTIAS
production, dynamics and demography of infaunal brittle stars (Amphiura filiformis and A. chiajei); regeneration and gonad development under different environmental conditions as hypoxia, contaminants and organic enrichment
- SMITH, ALBERT C.
writing book about marine animals in medical research (including echinoderms)
- SMITH, ANDREW B.
morphological and molecular phylogenies for echinoderms; post-Palaeozoic echinoid systematics and evolution
- SOLIS-MARIN, FRANCISCO A.
evolution of echinoids; taxonomy of the phylum
- STAMPANATO, SALVATORE
Antarctic starfish

- STANCYK, STEPHEN E.
population biology, predation and regeneration of Ophiura sarsi;
sublethal predation of echinoderms; use of markers and growth
rings of ophiuroid ossicles for age/growth studies
- STEWART, BRIAN G.
reproduction and growth of the euryalinid ophiuroid Astrobrachion
constrictum
- STICKLE JR., WILLIAM B.
the systematic status, zoogeographical distribution, and
environmental physiology of sea stars belonging to the
Leptasterias species complex; focusing on species differences in
the adaptation to a freshwater lens system that develops annually
at Little Port Walter, southern tip of Baranoff Island, south-
eastern Alaska (with Jeff Tamplin, Ph.D. Student)
- STRATHMANN, RICHARD R.
developmental plasticity of larvae in response to food
- TABLADO, ALEJANDRO
systematics of Asteroidea for southwestern Atlantic
- TAKAHASHI, KEIICHI
structure and function of the madreporite; motile mechanism in
sperm flagella
- THANDAR, AHMED S.
holothurians collected by the South African Museum's Africana II
cruises; new records of holothurians from the northern coast of
Natal; southern African holothuroids of the family Holothuriidae
- THIERRY, JACQUES
systematics, taxonomy, evolution, palaeoecology and
biostratigraphy of Jurassic echinoids, especially irregular ones;
possible extension to Cretaceous but only in collaboration to
compare biodiversity between the two systems
- THORSEN, MARIANNE S.
ecophysiology of irregular echinoids (spatangoids)
- UBAGHS, GEORGES J.
echinoderms from the Upper Cambrian of the Montagne Noire
(southern France)
- VADET, ALAIN
Jurassic echinoids
- VAN DER HAM, RAYMOND
Upper Cretaceous and Danian, SE Netherlands and NE Belgium
(Maastrichtian area)

VISTISEN, BODIL

studying the two brittle stars Ophiura albida and Amphiura filiformis concerning their tolerance towards hypoxi with and without the presence of hydrogenesulphide

WAREN, ANDERS H.

gastropods parasitizing echinoderms

WEBSTER, GARY D.

working on several Carboniferous crinoid faunas from the western U.S.; compiling the bibliography and index of Paleozoic crinoids & coronates, worldwide; relationship of Permian crinoid faunas of western Australia and Timor

WILKIE, IAIN C.

functional morphology, biomechanics and physiology of the echinoid lantern; morphological and mechanical aspects of the starfish autotomy; morphological and mechanical aspects of the ophiuroid mouth-frame; variable tensility of brittlestar ligaments

WORHEIDE, GERT

comparative biometrical and ecomorphological studies on boreal and Mediterranean populations of the Echinocardium cordatum (Pennant, 1777) group (Echinoidea, Spatangoida)

WRAY, GREGORY A.

developmental bases for major life history transformations in echinoderms; evolution of echinoderm larvae; origin and diversification of echinoderm body plans; phylogeny of camarodont sea urchins

ZAVODNIK, DUSAN V.

contributions to fauna and flora of the Adriatic Sea

REQUESTS AND INFORMATION

Bentley, A. - any news pertaining to sand dollars or any irregular urchins. Any news on occurrence or distribution of Echinodiscus bisperforatus from elsewhere around the world.

Breton, G. - Who could give to the Natural History Museum of Le Havre (France) one or two good specimen(s) (with or without spines) of the burrowing spatangoid sea-urchin Pericosmus? This rare bathyal echinoid is thought to be the present descendant of the Cretaceous Micraster. In a showcase dealing with the evolution of Micraster, I have put pictures of Pericosmus, but I would better present one or two specimen(s).

Conand, C. - As coordinator of the Beche-de-mer Information Bulletin published by the South Pacific Commission, I shall appreciate information on commercial sea-cucumbers, dealing with ecology, biology and fishery.

De Ridder, C. - requests information on symbioses involving bacteria and echinoderms.

Feduccia, J. - I'm seeking stock footage (film or video) of sea cucumbers with written permission for its use in a motion picture. The footage will be used to enhance the story line of an action-adventure sci-fi movie. Close-ups of cucumber's mouths and tentacles, the process of burrowing in the sand, habitat shots with other invertebrates, eating, a cluster of immature cucumbers, and an evisceration would be helpful. An evisceration in slow motion would be of particular usefulness. The story actually depends on some cucumber footage, and can (will) be modified to include more if it's spectacular. - If someone doesn't feel comfortable sending material directly to us, we'll try to make arrangements with a local library, or conform to other conditions. Any person or institution helping with this project obviously deserves a credit; we simply request specifics on how the credit should read. Please contact: Joseph Feduccia, 8626 Braewick, Houston, TX 77074-7708. Ph: 713-777-5162. FAX: 713-777-7445.

Feldman, A.L. - requests information on anything to do with echinoderm larvae, especially genus Luidia. If there is any new information on metamorphoses of ophiuroid larvae I would be especially interested in that, as I have specimens from plankton hauls I wish to identify. Also if anyone knows anything about finding larvae in the plankton I would like to get in touch with them to compare notes.

Gluchowski, E. - interested in information on Crinoidea in paleoecology and taphonomy, stratigraphy, morphology and stem taxonomy.

- Gooding, R.U. - requests examples of calcification of test from parasitism, e.g., thickening of terminal part of spine by rasping of Microlepas diadema, crater-like swellings caused by rasping of Rugilepas pearsi, both on Indo-Pacific diadematids. Also, requests copepods "external to the buccal cavity (within the Aristotle lamp)" of 2 Echinometra spp. and Tripneustes esculentus (ventricosus?), Puerto Rico.
- Guillou, M. - requests information on the plasticity of echinoderms in response to environment; temporal successions in echinoderm populations of the littoral ecosystems.
- Hartsock, F.B. - requests information on - the biology of Asterias species and Leptasterias spp.; medicinal, or other uses for sea stars; the ecology of Pycnopodia helianthoides, especially in relation to Paralithoides camtschatica; methods for aging sea stars; studies on missing arms of sea stars; studies on regenerative capabilities of sea stars.
- Hotchkiss, F.H.C. - information and material of 4-part and 6-part echinoids arising at metamorphosis (which is the extra/missing part?). Information and material of teratology of starfish.
- James, D.B. - would like references and, reprints if possible, on hatchery and culture of sea cucumbers.
- Kristan-Tollman, E. - interested in all papers about Triassic echinoderms for the Zentralblatt Geol. Pal. II, Referier Organ, Stuttgart, Germany. As the reporter for Holothuroidea, I would be happy to receive your papers on all aspects of fossil holothurians. Please send them to: Edith Kristan-Tollman, Scheibenbergstr. 53/6, A-1180 Wien, Austria. Also, I'm working on Comatulida and Roveacrinida and would be interested in an exchange of literature.
- Kurihara, T. - information on space pattern, population dynamics, and life history of starfishes.
- Lambert, P. - Trying to locate specimens of Cucumaria fallax Ludwig from Alaska. Apart from specimens at Smithsonian and one lot from Fairbanks have not located any.
- Moura-Britto, M. - I would like to know about recent studies of scanning electron microscopy in Asteroidea and Ophiuroidea.
- Mukai, H. - Suggests that it is time to publish a journal of echinoderm biology.
- Oji, T. - Information about new or undescribed crinoid occurrences from the Mesozoic and Cenozoic.

Pardo, R. - Is anyone working on ecology and population dynamics of echinoids (particularly sand dollars); also, bioerosion in coral or rocks for the echinoderms ?

Rowe, F.W.E. - would be very grateful to receive reprints and be put on reprint mailing list. I am particularly interested in taxonomic, zoogeographic, recent and palaeontological papers.

Segovia, E.M. - information about cultivation of sea urchins.

Shepherd, S.A. - currently engaged on a long-term project on the problems of stock assessment in dive-fisheries (which include molluscs, sea urchins and sea cucumbers). Of particular interest are: estimation of abundance, fertilization success in relation to affects of reduced abundance on recruitment, stock recruitment relations and fishery models. I would very much like to receive reports/reprints on these matters for sea-urchin or sea-cucumber fisheries.

Stewart, B.G. - information on euryalinid reproduction.

Thandar, A.S. - would like to receive/purchase English translations of: 1. Panning's (1929-35) revisions of the family Holothuriidae; 2. Heding and Panning's (1954) revision of the family Phyllophoridae.

Thierry, J. - if anyone has collected irregular echinoids in Jurassic deposits of western Europe please contact me; also, if anyone knows about or has ancient collections; especially interested in Collyritids of Metaporhinus group to make a revision of the genus and its species.

ITEMS OF INTEREST

Scally, K.B. - I compiled a recipe book of echinoid delights. Also, references on electronic database - like "Reference Manager" bought by subscription - including journals and books.

Contributed by F.W.E. Rowe

CLARK AND DOWNEY, 1992. STARFISHES OF THE ATLANTIC: FURTHER ERRATA

There was a late change (at page proof stage) in the symbols used in the distribution table (table 83, pp. 490-502) from plus

signs in various types according to the depths, to the letters S, M and D (for shallow, medium and deep). Unfortunately we omitted to make a corresponding change in the explanatory text concerning the apparent anomaly of records more than 200 m (M) being used in columns primarily for the continental shelf. Please note the following modifications:

Page 488

Line 21: Substitute 'As M rather than S' for 'but in italics'.

Lines 22 & 23: Delete whole sentence beginning 'A corollary -'.

Page 490

Caption to Table 83, center of line 2 should read: 'c. 500+ m'. Please ignore the occasional use of italics or bold type for a few entries in the table which crept in unnoticed.

RECENT PUBLICATIONS ON ECHINODERMS

- Ahearn, C.G. 1994. Catalog of the Type Specimens of Seastars (Echinodermata: Asteroidea) in the National Museum of Natural History, Smithsonian Institution. Smithsonian Contributions to Zoology. (in press).
- Amano, T., Y. Okita, M. Hoshi. 1993. Low-Na⁺ seawater induces the acrosome reaction and histone degradation of starfish sperm in the absence of egg jelly. *Develop. Growth, Differ.* 35: 521-529.
- Amano, T., Y. Okita, T. Yasumoto, M. Hoshi. 1993. Maitotoxin induces acrosome reaction and histone degradation of starfish Asterina pectinifera sperm. *Zool. Sci.* 10: 307-212.
- Ameziane-Cominardi, N. (in press). Les Pentacrines récoltées lors de la campagne KARUBAR (Indonesia). In *Resultat des campagne, MUSORSTOM*. 1994.
- Andrietti, F., M.D. Candia Carnevali, I.C. Wilkie. 1993. A bio-mechanical comparison of the lantern of the cidarid sea-urchin Stylocidaris affinis with the typical camarodont lantern. *J. Zool., London*, 231: 596-610.
- Arntz, W.E., T. Brey, D. Gerdes, M. Gorny, J. Gutt, S. Hain, M. Klages. 1992. Patterns of life history and population dynamics of benthic invertebrates under high Antarctic conditions in the Weddell Sea. *Proc. 25th Eur. mar. Biol. Symp.*: 221-230.
- Ausich, W.I., T.K. Baumiller. (in press). Taphonomic method for determining muscular articulations in fossil echinoderms: a test for the occurrence of muscles in Lower Mississippian cladid crinoids. *Palaios*.
- Ausich, W.I., T.K. Baumiller. (in press). Column regeneration in an Ordovician crinoid (Echinodermata): Paleobiologic implications. *Journal of Paleontology*.
- Avilov, S.A., V.I. Kalinin, A.I. Kalinovsky, V.A. Stonik. 1991. Cucumarioside G2 - minor triterpene glycoside from sea cucumber Eupentacta fraudatrix. *Khim. Prirod. Soedin*, N 3: 438-439.
- Avilov, S.A., A.I. Kalinovsky, V.A. Stonik. 1990. New triterpene glycoside from sea cucumber Neothyonidium magnum. *Khim. Prirod. Soedin*, N 1, 53-57.
- Avilov, S.A., A.I. Kalinovsky, V.A. Stonik. 1991. Two new triterpene glycosides from sea cucumber Duasmodyctyla kurilensis. *Khim. Prirod. Soedin*, N 2: 221-226.
- Avilov, S.A., V.A. Stonik, A.I. Kalinovsky. 1990. The structure of four new triterpene glycosides from sea cucumber Cucumaria japonica. *Khim. Prirod. Soedin*, N 6: 787-793.
- Avilov, S.A., V.I. Kalinin, O.A. Drosdova, A.I. Kalinovsky, V.A. Stonik, E.N. Gudimova. 1993. Triterpene glycosides of sea cucumber Cucumaria frondosa. *Khim. Prirod. Soedin*, N 2: 260-263.
- Azzi, L., L. Meijer, A.C. Ostvold, J. Lew, J.H. Wang. 1994. P15, a cdk4- and cdk5- binding protein. *J. Biol. Chem.*, (in press).
- Balser, E.J., E.E. Rupert. 1993. Ultrastructure of axial vascular and coelomic organs in comasterid featherstars (Echinodermata: Crinoidea). *Acta Zoologica* 74(2): 87-101.
- Balser, E.J., E.E. Rupert, W.B. Jaekle. 1993. Ultrastructure of

- the coeloms of *Auricularia* larvae (Holothuroidea:Echinodermata): evidence for the presence of an axocoel. Biol. Bull. 185:86-96.
- Barker, M.F., R. Scheibling, P.V. Mladenov. 1992. Seasonal changes in population structure of the fissiparous asteroids Allostichaster insignis (Farquhar) and Coscinasterias calamaria (Gray). In: Echinoderm Research 1991. L. Scalera-Liaci and C. Canicatti (eds.) A.A. Balkema, pp. 191-196.
- Bartsch, I. 1994. Siphonostomatoide Copepoden auf Ophiacanthiden (Ophiuroidea) Beschreibung von drei Cancerilla-Arten (Cancerillidae, Copepoda) aus der Antarktis. Mitt. hamb. zool. Mus. Inst. (in press).
- Baumiller, T.K. 1993. Crinoid stalks as cantilever beams and the nature of stalk ligament. Neu's Jahrbuch für Geologie and Paläontologie, Abhandlungen 190: 115-133.
- Baumiller, T.K., M. Labarbera. 1993. Mechanical properties of the stalk and cirri of a sea lily. Comparative Biochemistry and Physiology 106A: 91-95.
- Baumiller, T.K. 1993. Survivorship analysis of Paleozoic crinoidea: effect of filter morphology on evolutionary rates. Paleobiology 19: 304-321.
- Baumiller, T.K. 1993. Boreholes in Devonian blastoids and their implications for boring by platyceratids. Lethaia 26: 41-47.
- Belyaev, G.M., A.N. Mironov. 1993. Deep-sea starfishes of the genus Hyphalaster (Porcellanasteridae). Transactions of the P.P. Shirshov Institute of Oceanology, 127: 205-217.
- Bentley, A.C., A.C. Cockcroft. 1994. Sublittoral sand dollar (Echinodiscus bisperforatus) communities in two bays on the South African south coast. (in press).
- Bentley, A.C. (in press). Sand dollar (Echinodiscus bisperforatus) distribution and abundance in South Africa - implications for conservation and legislation. (short note).
- Birenheide, R., S. Amemiya, T. Motokawa. 1993. Penetration and storage of sponge spicules in tissues and coelom of spongivorous echinoids. Mar. Biol. 115: 677-683.
- Birenheide, R., T. Motokawa. 1994. Morphological basis and mechanics of arm movement in the stalked crinoid Metacrinus rotundus (Echinodermata, Crinoidea). Mar. Biol., in press.
- Blake, D.B. 1993. A new asteroid genus from the Jurassic of England and its functional significance. Palaeontology 36: 147-154.
- Blake, D.B. 1993. An unusual new asteroid (Echinodermata: Asteroidea) from the Cretaceous of California. Journal of Paleontology 67: 586-589.
- Blake, D.B., T.E. Guensburg. 1993. New lower and middle Ordovician stelleroids (Echinodermata) and their bearing on the origins and early history of the stelleroid echinoderms. Journal of Paleontology 67: 103-113.
- Bonasoro, F., M.D. Candia Carnevali. 1994. Atypical chordoid structures in the Aristotle's lantern of regular echinoids. Acta Zool., 75: 89-100.
- Borzzone, C.A. 1992. Spatial distribution and growth of Mellita quinquiesperforata (Leske, 1778) on a sandy beach of southern Brazil. Neritica, Pontal do Sul, Pr, 7 (1/2).

- Borzzone, C.A., J.R.B. de Souza, R. Brogim, S.A. Netto, A.G. Soares. (no prelo). Litoral do Parana. Em: A aplicabilidade dos atuais conhecimentos sobre o bentos da região sudeste brasileira a programas de monitoramento das atividades petrolíferas na Bacia de Santos. P.C. Lana Ed., Petrobras.
- Breton, G., D. Neraudeau, C. Cuenca-Boulat. 1992. Gnathichnus stellarum ichnosp. nov., trace de broutage d'un échinide du Campanien des Charentes (France). Revue de Paléobiologie, 11, 1, p. 219-229, fig. 1-11, 1 planche.
- Breton, G. 1992. Réexamen de l'holotype de Pentaceros dilatatus Meunier, 1906 [= Nymphaster obtusus (Forbes, 1848)], Goniasteridae (Asteroidea, Echinodermata), Crétacé supérieur du Bassin de Paris. Bull. Mus. natl. Hist. nat., Paris, 4e sér., 14, section C, 3-4: 267-276, 1 fig.-texte, 1 pl.
- Breton, G. 1993. Un spécimen de très grande taille de Discoides concavus Bucaille, 1883 (Echinoidea, Discoidae) du Cénomanién moyen de la région de Fécamp (Seine-Maritime). Bull. trim. Soc. géol. Normandie et Amis Muséum du Havre, 80, 1 et 2, p. 13-15, fig. 1.
- Breton, G., D. Lefebvre, M. Fouray. 1993. Anomalie de croissance chez un Echinocorys gr. scutata Leske, 1778; ou bien Stenonaster tuberculata (DeFrance, 1816) égaré dans les eaux boréales? Bull. trim. Soc. géol. Normandie et Amis Muséum du Havre, 80, 3 et 4, 3e-4e trim., p. 26-28, fig. 1-2.
- Brey, T., J. Gutt. 1991. The genus Sterechinus (Echinodermata): Echinoidea) on the Weddell Sea shelf (Antarctica): distribution, abundance and biomass. Polar Biol. 11: 227-232.
- Brey, T., M. Klages, C. Dahm, M. Gorny, J. Gutt, S. Hain, M. Stiller, W.E. Arntz, J.-W. Wägele, A. Zimmermann. 1994. Antarctic benthic diversity. Nature 368: 297.
- Brower, J.C. 1993. Paleoecology of a Middle Ordovician Pleurocystitid-Crinoid community from the midcontinent. Geological Society of America Abstracts Volume for 1993, v. 25, no. 2, p. 7.
- Brower, J.C. (in press). Camerate crinoids from the Middle Ordovician (Galena Group, Dunleith Formation) of northern Iowa and southern Minnesota. Journal of Paleontology for 1994.
- Brower, J.C. (in press). Eoparisocrinid crinoids from the Middle Ordovician (Galena Group, Dunleith Formation) of northern Iowa and southern Minnesota. Journal of Paleontology.
- Buitrón-Sánchez, B. 1991. Los equinodermos del Cretácico Temprano, Consejo Nacional de Ciencia y Tecnología, Información Científica y Tecnológica, vol. 13, nos. 179-180, p.15-18.
- Buitrón-Sánchez, B., F.A. Solis-Marín. 1993. La biodiversidad de los equinodermos fósiles y recientes de México. Rev. Soc. Mexicana, Hist. Nat. vol. esp. XLIV, p. 209-231.
- Byrne, M. 1992. Reproduction of sympatric populations of Patiriella calcar, P. exigua and P. gunnii, asterinid seastars with abbreviated development. Mar. Biol. 114: 297-316.
- Byrne, M. 1994. Class Ophiuroidea. In: F. Harrison and F.S. Chia (eds). Microanatomy of the Invertebrates. Vol. 14 Echinodermata. Alan R. Liss, New York. 247-343.

- Byrne, M., M.J. Anderson. 1994. Hybridization of sympatric Patiriella species (Echinodermata: Asteroidea) in New South Wales. Evolution (in press).
- Byrne, M., P. Moloney. 1994. Histology and ultrastructure of the ovaries and oogenesis in the ophiuroid Ophionereis schayeri. In: Echinoderms, Dijon. B. David et al, eds. Balkema, Rotterdam (in press).
- Cabanac, A., J.-F. Hamel, J.H. Himmelman. 1993. Morphological adaptation of the sand dollar Echinarachnius parma to facilitate righting itself. Canadian Journal of Zoology 71: 1274-1276.
- Cameron, R.A., S.E. Fraser, R.J. Britten, E.H. Davidson. 1991. Macromere cell fates during sea urchin development. Development 113: 1085-1091.
- Cameron, R.A., R.J. Britten, E.H. Davidson. 1993. The ciliated band of the sea urchin derives from both aboral and oral ectoderm territories. Dev. Biol. (in press).
- Cameron, R.A., C.S. Smith, R.J. Britten, E.H. Davidson. 1993. Ligand-dependent stimulation of introduced mammalian brain receptors alters spicule symmetry and other morphogenetic events in sea urchin embryos. Mechanisms of Development (in press).
- Campbell, A.C., M. Jensen. 1993. Rostrate pedcellariae: A morphologically distinct form of echinoid test appendage. J. Morphol. 218: 237-247.
- Campbell, D.B. 1993. The affect of pea crabs on predation of host mussels by sea stars. Mar. Behav. Physiol. 24: 93-99.
- Candia Carnevali, M.D., E. Lucca, F. Bonasoro. 1992. Morphogenesis, cell proliferation and growth factors in the early stages of arm regeneration in Antedon mediterranea (Echinodermata: Crinoidea). Animal Biology, 2, 114.
- Candia Carnevali, M.D., I.C. Wilkie, E. Lucca, F. Andrietti, G. Melone. 1993. The Aristotle's lantern of the sea-urchin Stylocidaris affinis (Echinoidea, Cidaridae): functional morphology of the musculo-skeletal system. Zoomorphology 113: 173-189.
- Candia Carnevali, M.D., E. Lucca, F. Bonasoro. 1993. Mechanism of arm regeneration in feather star Antedon mediterranea: healing of wound and early stages of development. J. Exp. Zool, 267:299-317.
- Candia Carnevali, M.D. 1993. Forma e Funzione. In: Progetto e Design, (Di Bartolo C. ed.), Tecniche Nuove, Milano. (in press).
- Candia Carnevali, M.D., F. Bonasoro, E. Lucca. 1993. Morphogenesis and pattern formation in the regeneration of the arm in Antedon mediterranea (Echinodermata, Crinoidea). Animal Biology, in press.
- Candia Carnevali, M.D., F. Bonasoro. 1994. Mechanisms of arm regeneration in Antedon mediterranea (Echinodermata, Crinoidea). (in press).
- Cerra, A., M. Byrne. 1993. Ultrastructure of wrinkled blastula formation in the direct developing seastar Patiriella exigua. Cell Biol. Int. 17: 798.
- Chiba, K., K. Kontani, H. Tadenuma, T. Katada, M. Hoshi. Induction of starfish oocyte maturation by the β -subunit of starfish G protein and possible existence of the subsequent effector in cytoplasm. Mol. Biol. Cell 4: 1027-1034.
- Clark, H.E.S., D.G. McKnight. (in press, 1994). Damnaster

- tasmani, a new genus and species of Asteroidea (Echinodermata) from New Zealand.
- Conand, C. 1993. Ecology and reproductive biology of Stichopus variegatus an Indo-Pacific coral reef sea cucumber (Echinodermata: Holothuroidea). Bull. Mar. Sci., 52(3):970-981.
- Conand, C. 1993. Reproductive biology of the characteristic holothurians from the major communities of the New Caledonia lagoon. Mar. Biol., 116: 439-450.
- Conand, C. 1992. Evolution récente des exploitations mondiales d'holoturies. In: Echinoderm Biology, L. Scalera-Liaci, C. Canicatti (eds.), Balkema, Rotterdam: 171-172.
- Conand, C. 1993. Recent evolution of Hong Kong and Singapore sea cucumber markets. S.P.C. Bêche-de-mer Information Bull, 5: 4-7.
- Conand, C., M. Byrne. 1994. Recent developments in the beche-de-mer fishery in the Indo-Pacific. Mar. Fish. Rev. (in press).
- De Ridder, C., M. Jangoux. 1993. The digestive tract of the spatangoid echinoid Echinocardium cordatum (Echinodermata): morphofunctional study. Acta Zoologica 74(4): 337-351.
- Dixon, H.L., S.K. Donovan, C.J. Veltkamp. 1994. Crinoid and ophiuroid ossicles from the Oligocene of Jamaica. Caribbean Journal of Science, 30: 143-145.
- Dolmatov, I. Yu. 1992. Regeneration of the aquapharyngeal complex in the holothurian Eupentacta fraudatrix (Holothuroidea, Dendrochirota). In: Keys for Regeneration. Monogr. Dev. Biol., v.23. Basel, Karger, p. 40-50.
- Dolmatov, I. Yu. 1993. Cell proliferation in regenerating aquapharyngeal complex of the holothurian Eupentacta fraudatrix. Ontogenez, v. 24, N 1: 72-81.
- Dolmatov, I. Yu., V.A. Ivantey. 1993. Longitudinal muscle band histogenesis in holothurians. Ontogenez, v. 24, N 6: 67-72.
- Dolmatov, I. Yu. 1994. Regenerative capacity and its changes in holothurian ontogenesis. Ontogenez, (in press).
- Dolmatov, I. Yu., N.D. Mokretsova. Morphology of the different aged pentactulae of the holothurian Cucumaria japonica (Holothuroidea, Dendrochirota). Zool. Zh. (in press).
- Donovan, S.K., C.J. Veltkamp. 1992. A diadematoid echinoid from the Lower Paleocene of Jamaica. Caribbean Journal of Science, 28: 222-224.
- Donovan, S.K. 1992. A new crinoid from the Ashgill Starfish Bed, Threave Glen. Scottish Journal of Geology, 28: 123-126.
- Donovan, S.K. 1992. A field guide to the fossil echinoderms of Coplow, Bellman and Salthill Quarries, Clitheroe, Lancashire. North West Geologist, 2: 33-54.
- Donovan, S.K. 1992. Jamaica's ancient 'sea-eggs'. Jamaica Journal, 24(2): 34-39.
- Donovan, S.K., E.N. Doyle, D.A.T. Harper. 1992. A flexible crinoid from the Llandovery (Silurian) of western Ireland. Journal of Paleontology, 66: 262-266.
- Donovan, S.K., D.N. Lewis. 1993. The H.L. Hawkins collection of Caribbean fossil echinoids: annotated catalog of rediscovered specimens from the University of Reading, England. Caribbean

- Journal of Science, 29: 186-201.
- Donovan, S.K., R.A. Williams, J.A. Rocke. 1993. Preservation of a clypeasteroid echinoid in Holocene beachrock, Jamaica. Caribbean Journal of Science, 29: 264-267.
- Donovan, S.K. 1993. Jamaican Cretaceous Echinoidea. Geological Society of America Memoir, 182: 93-103.
- Donovan, S.K., C.M. Gordon, C.J. Veltkamp, A.D. Scott. 1993. Crinoids, asteroids, and ophiuroids in the Jamaican fossil record. Geological Society of America Memoir, 182: 125-130.
- Donovan, S.K. 1993. Jamaican Cenozoic Echinoidea. Geological Society of America Memoir, 182: 371-412.
- Donovan, S.K. 1993. Contractile tissues in the cirri of ancient crinoids: criteria for recognition. Lethaia, 26: 163-169.
- Donovan, S.K., C.J. Veltkamp. 1993. Crinoids from the upper Ashgill (Upper Ordovician) of Wales. Journal of Paleontology, 67: 604-613.
- Donovan, S.K., C.M. Gordon. 1993. Echinoid taphonomy and the fossil record: supporting evidence from the Plio-Pleistocene of the Caribbean. Palaios, 8: 304-306.
- Donovan, S.K., R.K. Pickerill. 1993. A new species of regular echinoid from the Richmond Formation (Eocene) of Jamaica. Tertiary Research, 14: 111-115.
- Donovan, S.K., C.R.C. Paul. 1993. Stephanocrinus (Echinodermata, Blastozoa) from Europe. Journal of Paleontology, 67: 309.
- Donovan, S.K. 1993. A Rhuddanian (Silurian, Lower Llandovery) pelmatozoan fauna from south-west Wales. Geological Journal, 28: 1-19.
- Donovan, S.K., D.A.T. Harper. 1993. The pelmatozoan fauna of the High Mains Formation (Ordovician: Hirnantian) of the Craighead Inlier, Strathclyde. Transactions of the Royal Society of Edinburgh: Earth Sciences, 83 (for 1992): 669-677.
- Donovan, S.K., H.L. Dixon, C.J. Veltkamp. 1994. Some echinoid plates from the Lower Eocene Richmond Formation of Jamaica. Caribbean Journal of Science, 30: 145-148.
- Donovan, S.K., B. Jones. 1994. Pleistocene echinoids from Bermuda and Barbados. Proceedings of the Biological Society of Washington, 107: 109-113.
- Donovan, S.K. 1994. The late Ordovician extinction of the crinoids in Britain. National Geographic Research and Exploration, 10: 72-79.
- Donovan, S.K., H.L. Dixon, R.K. Pickerill, E.N. Doyle. 1994. Pleistocene echinoid (Echinodermata) fauna from southeast Jamaica. Journal of Paleontology, 68: 351-358.
- Drosdova, O.A., S.A. Avilov, A.I. Kalinovskiy, V.A. Stonik. 1992. New acetylated glycoside from sea cucumber Cucumaria japonica. Khim. Prirod. Soedin, N 5: 590-591.
- Drosdova, O.A., S.A. Avilov, A.I. Kalinovskiy, V.A. Stonik. 1992. Minor glycoside from sea cucumber Cucumaria japonica. Khim. Prirod. Soedin, N 5: 593.
- Drosdova, O.A., S.A. Avilov, A.I. Kalinovskiy, V.A. Stonik, Yu. M. Milgrom, Ya.W. Rashkes. Thirsulfated glycosides from sea cucumber Cucumaria japonica. Khim. Prirod. Soedin, N 3: 369-374.

- Drummond, A.E. 1993. Exposure to wave action: some consequences for the sea urchin Stomopneustes variolaris on the Natal coast. S. Afr. J. of Zoology 28(4): 198-201.
- Edwards, K., S.H. Grossman, J.M. Lawrence. 1992. Characterization and inhibition kinetics of cadmium on cytoplasmic malate dehydrogenase from the pyloric caeca of Luidia clathrata (Say) (Echinodermata: Asteroidea). Comp. Biochem. Physiol. 103B:159-162
- Eckhaut, I., D. Van den Spiegel, M.J. Grygier. 1993. Mysostomida from Singapore, with related Indo-Pacific distribution records & descriptions of three species. Raffles Bull. Zool. (in press).
- Eliseikina, M.G. 1992. Seasonal changes in digestive tract epithelium of Cucumaria japonica. Biol. Morya, N 1-2: 69-76.
- Eliseikina, M.G., N.L. Leibson. 1993. Construction and proliferation seasonal changes of digestive epithelium cells in Cucumaria japonica. I. Histological and ultrastructural analysis. Tsitologia (in press).
- Emson, R.H., P.S. Rainbow, P.V. Mladenov. 1992. Heavy metals in sea-stars from Tolo Channel, Hong Kong. In: The Marine Flora & Fauna of Hong Kong and Southern China III. B. Morton (ed.). Hong Kong University Press, Vol 2, pp. 611-620.
- Emson, R.H., P.V. Mladenov. 1992. Field and laboratory observations on the feeding of Macrophiothrix longipeda (Lamarck) with notes on the feeding of Ophiactis savignyi (Müller & Troschel). In: The Marine Flora & Fauna of Hong Kong and Southern China III. B. Morton (ed.). Hong Kong University Press, Vol 2, pp. 769-780.
- Féral, J.-P., E. Derelle, H. Philippe. 1994. Inferred phylogenetic trees of Antarctic brood-protecting schizasterid echinoids from partial 28S ribosomal RNA sequences. In: Genetics and Evolution of Aquatic Organisms, A.R. Beaumont (ed.), Chapman & Hall: London, pp. 199-207.
- Fujita, T. 1992. Dense beds of ophiuroids from the Paleozoic to the Recent: the significance of bathyal populations. Otsuchi Marine Research Center Report, 18: 25-41.
- Gale, A.S., S.K. Donovan. 1992. Predatory asteroids and articulate brachiopods: a reply. Lethaia 25: 346-348.
- Gluchowski, E. 1993. Crinoid assemblages in the Polish Givetian and Frasnian. Acta Palaeontologica Polonica vol. 38, No. 1/2: 35-92. Warszawa.
- Gluchowski, E. 1993. Upper Emsian crinoids from the Bukowa Góra quarry in the Klonów Range, Holy Cross Mts. Prace Naukowe Uniwersytetu Śląskiego, no. 1331, Geologia vol. 12/13, pp. 159-174, Katowice.
- Golde, H.M., M.P. Crosby, C.R. Lovell, S.E. Stancyk. (in press). Reduction of marine sediment oxygen uptake: pre-treatment for the determination of infaunal respiration rates. Marine Ecology Progress Series.
- Gordon, C.M., S.K. Donovan. 1992. Disarticulated echinoid ossicles in paleoecology and taphonomy: the last interglacial Falmouth Formation of Jamaica. Palaios, 7: 157-166.
- Gordon, C.M., S.K. Donovan. 1994. Some fossil echinoids (Echinodermata) from the Neogene of St. Croix, U.S. Virgin Islands. Caribbean Journal of Science, 30: 69-75.

- Grabowsky, G. 1993. Symmetry, locomotion and the evolution of an anterior end: A lesson from sea urchins. Evolution (in press).
- Greenstein, B.J. (in press). Is the fossil record of the regular echinoid really so poor? A comparison of recent and subfossil assemblages. Palaios.
- Guillou, M., C. Michel. 1993. Impact de la variabilité du recrutement sur le stock d'oursins commercialisables de l'archipel de Glénan (Sud-Bretagne). Oceanologica Acta, 16(4): 423-430.
- Guillou, M., C. Michel. (in press). The influence of environmental factors on the growth of Sphaerechinus granularis (Lamarck) (Echinodermata: Echinoidea). J. Exp. Mar. Biol. Ecol.
- Gutt, J. 1990. New Antarctic holothurians (Echinodermata) - I. Five new species with four new genera of the order Dendrochirotida. Zool. Scr. 19: 101-117.
- Gutt, J. 1990. New Antarctic holothurians (Echinodermata) - II. Four species of the orders Aspidochirotida, Elasipodida and Apodida. Zool. Scr. 19: 119-127.
- Gutt, J. 1991. On the distribution and ecology of holothurians on the Weddell Sea shelf (Antarctica). Polar Biol. 11: 145-155.
- Gutt, J. 1991. Investigations on brood-protection in Psolus dubiosus (Echinodermata: Holothuroidea) from Antarctica in spring and autumn. Mar. Biol. 111: 281-286.
- Gutt, J. 1991. Are Weddell Sea holothurians typical representatives of the Antarctic benthos? A comparative study with new results. Meeresforsch. 33: 312-329.
- Gutt, J., M. Klages. 1991. In situ observations on the genus Bathyplores (Holothuroidea, Echinodermata) in Antarctica and its relevance to taxonomy. Zool. Scr. 20 (3): 301-306.
- Gutt, J., D. Piepenburg. 1991. Dense aggregations of three deep-sea holothurians in the southern Weddell Sea, Antarctica. Mar. Ecol. Prog. Ser. 68: 277-285.
- Gutt, J., D. Gerdes, M. Klages. 1992. Seasonality and spatial variability in the reproduction of two Antarctic holothurians (Echinodermata). Polar Biol. 11: 533-544.
- Hagdorn, H., E. Gluchowski. 1993. Palaeobiogeography and stratigraphy of Muschelkalk Echinoderms (Crinoidea, Echinoidea) in Upper Silesia. In: H. Hagdorn & A. Seilacher (eds): Muschelkalk. Schöntaler Symposium 1991: 165-176. Stuttgart.
- Hagdorn, H., E. Gluchowski, Boczarowski, A. (in press). The crinoid fauna of the Diplopore-dolomite (Triassic, Middle Muschelkalk, Upper Anisian) at Piekary Śląskie in Upper Silesia. Geologisch-Paläontologische Mitteilungen, Innsbruck.
- Hamel, J.-F., J.H. Himmelman, L. Dufresne. 1993. Gametogenesis and spawning in the sea cucumber Psolus fabricii (Düben and Koren). The Biological Bulletin 184: 125-143.
- Hamel, J.-F., J.H. Himmelman. 1992. Sexual dimorphism in the sand dollar Echinarachnius parma. Marine Biology 113: 379-383.
- Hamel, J.-F., A. Mercier. Behavioural response of basket star Gorgonocephalus arcticus in reaction to mechanical stimulation. (in press). Life and Environments 44(1).
- Hintz, J.L., J.M. Lawrence. (in press). Acclimation of gametes to

- reduced salinity prior to spawning in Luidia clathrata (Say) (Echinodermata: Asteroidea). Mar. Biol.
- Hoshi, M. 1993. Glycosphingolipids: important membrane components rather neglected in biotechnology. Biol. Internat. Special Issue No. 28: 33-37.
- Hotchkiss, F.H.C. 1993. A new Devonian ophiuroid (Echinodermata: Oegophiurida) from New York State and its bearing on the origin of ophiuroid upper arm plates. Proc. Biol. Soc. Wash. 106(1): 63-84.
- Ilyin, S.G., V.F. Sharipov, V.A. Stonik, M. Yu. Antipin, Yu. T. Struchkov, G.B. Elyakov. 1991. The crystal and molecular structure of 23(S)-acetoxy-9beta-holost-7-en-3beta-ol & stereochemical peculiarities of the double bond migration from position 7(8) to 8(9) and 9(11) in triterpenoids of the holostane series. Bioorg. khim. 17: 1123-1127.
- Ilyin, S.G., M.V. Reshetnijak, A.P. Schedrin, Yu. T. Struchkov, I.I. Kapustina, V.A. Stonik, G.B. Elyakov. 1990. Crystal and molecular structure of trihydrate of 6 α , 8 β , 15 β -trihydroxy-3 β , 24R-di-(α -D-xylopyranosyl)-5 α -cholest-22(23)-en. Dokl. Akad. Nauk SSSR. 314: 637-639.
- Irimura, S. 1993. Ophiostriatus sexradiatus, a new species of Ophiuroidea from the Northern Mariana Islands. Bull. of the Nat. Sci. Mus. Ser. A (Zool.) 19 (4).
- Irimura, S., M. Shigei, M. Saba, I. Kogo, A. Asakura. 1994. Echinoderms collected from the Northern Mariana Islands, Micronesia. Nat. Hist. Mus. & Inst., Chiba, Special Issue, No. 1; 293-297.
- Jablonski, D. 1993. The tropics as a source of evolutionary novelty: The post-Palaeozoic fossil record of marine invertebrates. Nature 364: 142-144.
- Jablonski, D. 1993. Mass extinctions: new answers, new questions [expanded and updated]. In: K. Mallory and L. Kaufman, eds., The Last Extinction. 2nd ed. Cambridge, Mass.: MIT Press, 44-68.
- Jablonski, D. 1993. Dispersal and extinction. In: E.A. Norse, ed., Global marine biological diversity: A strategy for building conservation into decision making. Wash.D.C.: Island Press, 79-81.
- Jablonski, D. 1994. Extinction in the fossil record. Phil. Trans. Roy. Soc. London, in press.
- Jablonski, D. 1994. Extinction in the fossil record [expanded version]. In: J.H. Lawton and R.M. May, eds., Estimating extinction rates. Oxford: Oxford Univ. Press, in press.
- Jaekle, W.B. 1994. Multiple modes of asexual reproduction by tropical and subtropical seastar larvae: an unusual adaptation for genetic dispersal and survival. Biol. Bull. 186 (in press).
- James, D.B. 1993. Part II. Sea urchin culture. In: Sea Weed, Sea Urchin, and Sea Cucumber. Handbook on Aquafarming. pp. 23-30. The Marine Products Development Authority, Kochi.
- James, D.B. 1993. Part III. Sea cucumber culture. In: Sea Weed, Sea Urchin, and Sea Cucumber. Handbook on Aquafarming. pp. 33-47. The Marine Products Development Authority, Kochi.
- James, D.B. 1993. Sea cucumber. Technical Paper presented at the Business Session of INDAQUA, Madras. pp. 3.

- James, D.B., M. Kathirvel, K. Ramdoss, A. Chellam. 1993. The spawning of the holothurian Actinopyga mauritiana (Quoy & Gaimard) on board FORV Sagar Sampada. J. mar. biol. Assoc. India. 35 (1&2): 220-221.
- James, D.B., A.D. Gandhi, N. Palaniswamy, J.X. Rodrigo. 1994. Hatchery techniques and culture of sea cucumber Holothuria scabra. CMFRI Spl. Pub., No. 57: 1-32.
- James, D.B. 1994. An annotated bibliography on sea cucumbers. CMFRI Spl. Pub., No. 58: 1-80.
- James, D.B., P.S.B.R. James. 1994. A handbook on Indian sea cucumbers. CMFRI Spl. Pub., No. 59: 1-47.
- James, D.B., A.D. Gandhi, N. Palaniswamy. 1993. Sea ranching of sea cucumbers. Mar. Fish. Infor. Serv., T & E, No. 124: 15-17.
- James, D.B. 1994. Seed production in sea cucumbers. Aqua International, 1 (9): 15-26.
- James, P.S.B.R., D.B. James. 1994. Management of Beche-de-mer industry in India. In: K. Rengarajan and D.B. James (Eds.). Proceedings of the National Workshop on Beche-de-mer. Bull. Cent. Mar. Fish. Res. Inst., 46: 17-22.
- James, P.S.B.R., D.B. James. 1994. Conservation and management of sea cucumber resources of India. Ibid., 46: 23-36.
- James, D.B. 1994. Holothurian resources from India and their exploitation. Ibid., 46: 27-31.
- James, D.B. 1994. Zoogeography and systematics of holothurians used for Beche-de-mer in India. Ibid., 46: 34-36.
- James, D.B. 1994. Ecology of commercially important holothurians of India. Ibid., 46: 37-38.
- James, D.B. 1994. A review of the hatchery and culture practices in Japan and China with special reference to possibilities of culturing holothurians in India. Ibid., 46: 63-65.
- James, D.B. 1994. Improved methods of processing holothurians for Beche-de-mer. Ibid., 46: 71-75.
- James, D.B., M.E. Rajapandian, C.P. Gopinathan, B.K. Baskar. 1994. Breakthrough in induced breeding and rearing of the larvae and juveniles of Holothuria (Metriatyla) scabra Jaeger. Ibid., 46: 66-70.
- James, D.B., B.K. Baskar. 1994. Present status of the Beche-de-mer industry in the Palk Bay and the Gulf of Mannar. Ibid., 46: 85-90.
- James, D.B., M. Ali Manikfan. 1994. Some remarks on the present status of Beche-de-mer industry of Maldives and its lessons for the Lakshadweep. Ibid., 46: 101-105.
- James, P.S.B.R., D.B. James. 1993. Ecology, breeding, seed production and prospects for farming of sea cucumbers from the seas around India. Fishing Chimes 13(3): 24-34.
- Jell, P.A., R.J. Willink. 1993. Early Permian cladid crinoids from the Gharif Formation of Oman. Memoirs of the Association of Australasian Palaeontologists, 15: 305-312.
- Kalinin, V.I., V.A. Stonik, S.A. Avilov. 1990. Homological viability and the trend of evolution of triterpene glycosides in Holothurioidea. Zhurn. Obshei biologii. 51: 247-260.
- Kalinin, V.I. 1992. Morphological trends in evolution of the holothurian triterpene glycosides (Holothurioidea, Echinodermata)

- Zhurn. Obshei biologii. 53: 672-688.
- Kalinin, V.I., S.A. Avilov, A.I. Kalinovsky, V.A. Stonik, Yu. M. Milgrom, Ya. W. Rashkes. 1992. Cucumarioside G4- New triterpene glycoside from sea cucumber Eupentacta fraudatrix. Khim. Prirod. Soedin, N 6: 691-694.
- Kalinin, V.I., S.A. Avilov, A.I. Kalinovsky, V.A. Stonik. 1992. Cucumarioside G3 - Minor triterpene glycoside from sea cucumber Eupentacta fraudatrix. Khim. Prirod. Soedin, N 6: 729-730.
- Kalinin, V.I., O.V. Volkova, G.N. Likhatskaya, N.G. Prokofieva, I.G. Agafonova, M.M. Anisimov, A.I. Kalinovsky, S.A. Avilov, V.A. Stonik. 1992. Hemolytic activity of triterpene glycosides from the Cucumariidae family Holothurians and evolution of this group of toxins. Journ. Natural Toxins. 1: 17-30.
- Kalinin, V.I., V.S. Levin, V.A. Stonik. 1994. The chemical morphology: Triterpene glycosides of sea cucumbers. Vladivostok: Dalnauka. [issued April-May 1994].
- Kapustina, I.I., T.N. Makarieva, V.A. Stonik, A.I. Kalinovsky. 1993. Steroid derivatives from ophiuroids. III. Sulfated steroids from Gorgonocephalus caryi. Khim. Prirod. Soedin, N 2: 305-306.
- Kicha, A.A., A.I. Kalinovsky, V.A. Stonik. 1990. Minor polyoxysteroids from starfish Crossaster papposus. Khim. Prirod. Soedin, N 2: 218-221.
- Kicha, A.A., A.I. Kalinovsky, V.A. Stonik. 1992. Aglycones from glycosides of starfish Lethasterias nanimensis chelifera. Khim. Prirod. Soedin, N 1: 145-146.
- Kicha, A.A., A.I. Kalinovsky, V.A. Stonik. 1993. Steroid glycosides of starfish Crossaster papposus. Khim. Prirod. Soedin, N2: 257-260.
- Kicha, A.A., A.I. Kalinovsky, V.A. Stonik. 1991. Steroid sulfates from starfish Lethasterias nanimensis chelifera. Khim. Prirod. Soedin, N 4: 520-523.
- Kicha, A.A., A.I. Kalinovsky, N.V. Ivanchina, V.A. Stonik. 1993. Steroid glycosides from starfish Solaster dawsoni Verrill. Izvestiya Akad. Nauk. Ser. Khim. N 5: 980-982.
- Kicha, A.A., A.I. Kalinovsky, N.V. Gorbach, V.A. Stonik. 1993. New polyoxysteroids from far eastern starfish Henricia sp. Khim. Prirod. Soedin, N 2: 249-253.
- King, C.K., O. Hoegh-Guldberg, M. Byrne. 1994. The reproductive cycle of Centrostephanus rodgersii (Echinoidea), with recommendations for the establishment of a sea urchin fishery in New South Wales. Mar. Biol. (in press).
- Klinger, T.S., J.M. Lawrence, A.L. Lawrence. (in press). Digestive characteristics of the sea-urchin Lytechinus variegatus (Lamarck) (Echinodermata: Echinoidea) fed prepared feeds. Journal of the World Aquaculture Society.
- Kobayashi, N. 1992. Toxicity bioassay by using sea urchin eggs for sea water and chemicals. J. Jpn. Soc. Water Environm. 10: 643-654 (in Japanese).
- Kobayashi, N. 1992. Spawning periodicity of sea urchins at Seto IV. Hemicentrotus pulcherrimus. Publ. Seto Mar. Biol. Lab. 35: 335-345.
- Kobayashi, N., T.Kh. Naidenko, M.A. Vashchenko. Standardization of bioassay using sea urchin embryos. Biol. morya (in press, Russian)

- Kristan-Tollman, E., K. Strele. 1994. Die Crinoiden-Vergesellschaftung der unterkarnischen Mürztaler Schichten der Mürzschlucht bei Frein, Steiermark, Österreich. Jubiläumsschr. 20 Jahre geolog. Zusammenarbeit Österreich-Ungarn, Teil 2 (in press).
- Kurihara, T. 1994. Distribution of starfishes (Asteroidea) on the continental shelf and in the geographical distributional area. Benthos Research, (in Japanese), (in press).
- Lawrence, J.M., W.D. Mahon, W. Avery, M. Lares. 1993. Concentrations of metals in Luidia clathrata and Luidia senegalensis (Echinodermata: Asteroidea) in Tampa Bay and the nearshore Gulf of Mexico, Florida. Comp. Biochem. Physiol., 105C, 203-206.
- Lawrence, J.M., A. Larrain. (in press). The cost of arm autotomy in the starfish Stichaster striatus (Echinodermata: Asteroidea). Mar. Ecol. Prog. Ser.
- Lawrence, J.M., M. Byrne. 1994. Allocation of resources to body components in Heliocidaris erythrogramma and Heliocidaris tuberculata (Echinodermata: Echinoidea). Zool. Sci. 11, 133-137.
- Lawrence, J.M., B.D. Robbins, S.S. Bell. (in press). Scaling of the pieces of the Aristotle's lantern in five species of Strongylocentrotus (Echinodermata: Echinoidea). J. Nat. Hist.
- LeClair, E.E. 1993. Effects of anatomy and environment on the relative preservability of two asteroid species: a biomechanical comparison. Palaios, 8: 233-243.
- Le Menn, J., S. Regnault. 1993. Découverte de microcrinoïdes dans le Dévonien supérieur du Maroc. C.R.Acad.Sci.Paris, t.316:251-56.
- Levin, V.S., T.KH. Naidenko. 1990. Variability of morphological features in the laboratory-reared sea urchin Strongylocentrotus intermedius. In: Biology of the Marine Invertebrates. Valdivostok, pp. 84-90 (in Russian).
- Levina, E.V., S.N. Fedorov, V.A. Stonik, P.V. Andriyaschenko, A.I. Kalinovskiy, V.V. Isakov. 1990. Steroid derivatives from ophiuroids II. Sulfated steroids from Ophiura sarsi and Ophiura leptoctenia. Khim. Prirod. Soedin, N 4: 483-487.
- Levitan, D.R. 1993. The importance of sperm limitation to the evolution of egg size in marine invertebrates. American Naturalist 141: 517-536.
- Liao, Y., A.M. Clark. The echinoderms of southern China.
- Litvinova, N.M. 1994. The mouth structure of brittlestars according to peculiarities of their food and feeding strategy. Tr. Inst. Ocean., N129: 85-96.
- Litvinova, N.M. 1992. Revision of the genus Ophiotholia (Echinodermata: Ophiuroidea). Zool. Zh., 71 (N3): 47-57.
- Llewellyn, G., C.G. Messing. (in press). Compositional and taphonomic variations in modern crinoid-rich sediments from the deep-water margin of a carbonate bank. Palaios.
- Loyer, P., D. Glaize, S. Cariou, G. Baffet, L. Meijer, C. Gugen-Guillouzo. 1994. Involvement of p34cdc2 and p33cdk2 kinases in cell cycle progression of hepatocytes during liver regeneration. J. Biol. Chem., (in press).
- Maier, M.S., A.J. Roccatagliata, A.M. Seldes. 1993. Two novel steroidal glycoside sulfates from the starfish Cosmasterias

- lurida. Journal of Natural Products, 56(6): 939-942.
- Makarieva, T.N., V.A. Sonik, I.I. Kapustina, V.M. Boguslavsky, A.S. Dmitrenok, V.I. Kalinin, M.L. Cordeiro, C. Djerassi. 1993. Biosynthetic studies of marine lipids. 42. Biosynthesis of steroid and triterpenoid metabolites in the sea cucumber Eupentacta fraudatrix. Steroids, 58: 508-517.
- Marsh, L.M., A.C. Campbell. 1991. A new species of Ferdina (Echinodermata: Asteroidea) from the Sultanate of Oman with discussion of the relationships of the genus within the family Ophidiasteridae. Bull. Br. Mus. Nat. Hist. (Zool.) 57(2):213-219.
- Marsh, L.M., D.L. Pawson. 1993. Echinoderms of Rottnest Island, in The Marine Flora and Fauna of Rottnest Island, Western Australia. F.E. Wells, D.I. Walker, H. Kirkman, R. Lethbridge (eds.). Proceedings of the Fifth International Marine Biological Workshop. Western Australian Museum, Perth: 279-304.
- Marsh, L.M., L.L. Vail, A.K. Hoggett, F.W.E. Rowe. 1993. Echinoderms of Ashmore Reef and Cartier Island, pp. 53-65, in Marine Faunal Surveys of Ashmore Reef and Cartier Island, north-western Australia, ed. P.F. Berry. Records of the Western Australia Museum, Suppl. no. 44.
- Matranga, V., D. Di Ferro, F. Zito, M. Cervello, E. Nakano. 1992. A new extracellular matrix protein of the sea urchin embryo with properties of a substrate adhesion molecule. Roux's Arch Dev Biol 201: 173-178.
- McKenzie, J.D., M. Kelly. (in press). A comparative study of subcuticular bacteria in brittlestars (Echinodermata: Ophiuroidea). Marine Biology.
- McKie, T., S.K. Donovan. 1992. Lower Cambrian echinoderm ossicles from the Fucoid Beds, northwest Scotland. Scottish Journal of Geology, 28: 49-53.
- McKinney, M.L., K.J. McNamara, B.D. Carter, S.K. Donovan. 1992. Evolution of Paleogene echinoids: a global and regional view. In Prothero, D.R. & Berggren, W.A. (eds), Eocene-Oligocene Climatic and Biotic Evolution: 349-367. Princeton University Press, Princeton, New Jersey.
- McKnight, D.G., H.E.S. Clark. Enigmaster scalaris, n. gen., n. sp., a puzzling seastar (Echinodermata, Asteroidea) from the Auckland Islands. (draft form only).
- Meijer, L., G. Mordret. 1994. Starfish oocyte maturation: from prophase to metaphase. Seminars in Developmental Biology, in press.
- Mercier, A., E. Pelletier, J.-F. Hamel. (in press). Degradation and toxicity of butyltin compounds in starfish. Proceedings of the 20th Aquatic Toxicologic Annual Conference, Quebec.
- Mercier, A., E. Pelletier, J.-F. Hamel. 1993. Metabolism and subtle toxic effects of butyltin compounds in starfish. Aquatic Toxicology (in press).
- Meyer, D.L., T. Oji. 1993. Eocene crinoids from Seymour Island, Antarctic Peninsula: Paleobiogeographic and paleoecologic implications. Journal of Paleontology 67(2): 250-257.
- Mironov, A.N. 1993. Types of external appearance and adaptive evolution of echinoids. Oceanology 30(6): 406-414.

- Mironov, A.N. 1993. Deep-sea echinoids (Echinodermata: Echinoidea) of the South Atlantic. Transactions of the P.P. Shirshov Institute of Oceanology, 127: 218-227.
- Mladenov, P.V., R.D. Burke. 1993. Asexual propagation in echinoderms. In: Reproductive Biology of Invertebrates, Vol. 6. Ed. by K.G. Adiyodi, R.G. Adiyodi. Oxford & IBH (in press).
- Mladenov, P.V., R.H. Emson. 1992. Population size-structure and the relationship between body-size and fission in the brittle star Ophiactis savignyi (Echinodermata: Ophiuroidea) from Hong Kong. In: The Marine Flora & Fauna of Hong Kong and Southern China III. B. Morton (ed.). Hong Kong University Press, Vol 1, pp. 447-451.
- Monsees, T., L. Meijer, B. Jastorff. 1993. 8-Dimethylamino-1-methyladenine, a novel potent antagonist of the 1-methyladenine receptor in starfish oocytes. Eur. J. Biochem. 213, 155-165.
- Morton, B., P.V. Mladenov. 1992. The associates of Tropiometra afra-macrodiscus (Echinodermata: Crinoidea) in Hong Kong. In: The Marine Flora & Fauna of Hong Kong and Southern China III. B. Morton (ed.). Hong Kong University Press, Vol 1, pp. 431-438.
- Mukai, H. 1993. Dispersion of larvae and distribution of adults. Monthly Ocean (Gekkan Kaiyo), 25: 257-263. (in Japanese)
- Munar, J. 1993. "Els equinoderms". In Alcover, J.A., Ballesteros, E., Fornós, J.J. (Eds.), Història Natural de l'Arxipèlag de Cabrera, CSIC-Edit. Moll, Mon. Soc. Hist. Nat. Balears 2: 597-606.
- Murphy, C.J., P.V. Mladenov. 1992. Autotomy promoting factor (AF) in SW Pacific sea stars. In: Proceedings of the 3rd Pacific-Asia Symp. on natural substances of biological interest. C. Debitus, P. Amade, D. Laurent & J.-P. Cosson (eds). ORSTOM, pp. 411-420.
- Naidenko, T. KH. 1990. Effect of environmental pollution on viability of the offspring of sea urchins. Abnormal development. In: Pacific Annual 89-90. Valdivostok: Far East Branch of Russian Academy of Sciences, pp. 38-49.
- Neira, R., P. Barba, R. Pardo. 1992. Equinodermos de la Ensenada de Utría (Pacífico colombiano). Anales del Instituto de Investigaciones Marinas Punta de Betín, Santa Marta No.21:77-83.
- Neraudeau, D., G. Breton. 1993. Astérides du Cénozoïque de Charente-Maritime (S.W. France). Geobios, 26, 1, p. 105-120, fig. 1-17, 1 pl.
- Neraudeau, D., G. Breton. 1993. Un assemblage de Macraster cf. polygonus, spatangoïde primitif de l'Albien moyen de Saint-Jouin (Seine-Maritime): développement ontogénique, démographie, paléoécologie. Bull. trim. Soc. géol. Normandie et Amis Muséum du Havre, 80, 3 et 4, 3e-4e trim., p. 53-62, fig. 1-15, 1 pl.
- Neraudeau, D., P. Destombes, G. Breton. 1993. Fossilisation d'échinides juvéniles proches du stade larvaire dans le Campanien de Longuesse (Val d'Oise, France). Bull. trim. Soc. géol. Normandie et Amis Muséum du Havre, 80, 3 et 4, 3e-4e trim., p. 63-66, 1 pl.
- Nichols, D. 1994. Reproductive seasonality in the comatulid crinoid Antedon bifida (Pennant) from the English channel.

- Philos. Trans. R. Soc. B., 343: 113-134.
- Oji, T., Okamoto, T. Arm autotomy and arm branching pattern as anti-predatory adaptations in stalked and stalkless crinoids. Paleobiology (in press).
- Pabian, R.K. 1993. Anal sacs on late Pennsylvanian corymocrinids from Nebraska and Kansas. 103rd Annual Meeting, Nebraska Academy of Sciences, April 16, 17, 1993, Nebraska Wesleyan Univ., Lincoln [abstract] p.65.
- Pabian, R.K., H.L. Strimple. 1993. Taxonomy, paleoecology and biostratigraphy of the crinoids of the South Bend Limestone (Late Pennsylvanian, Missourian-Virgilian in southeastern Nebraska and southeastern Kansas. Conservation and Survey Div., Inst. of Agric. and Nat. Res., Professional Paper 1, 55 pp.
- Pardo, R., R. Neira, J.R. Cantera. 1988. Estudio taxonómico y ecológico de los principales grupos de equinodermos del litoral Pacífico Colombiano. Memorias del VI Seminario de Ciencias y Tecnologías del Mar. Comisión Colombiana de Oceanografía CCO, Santafé de Bogotá D.C. Diciembre 1988: 115-121.
- Pardo, R., R. Neira. 1990. Lista Anotada de los equinodermos de la Ensenada de Tumaco (Pacífico colombiano). Memorias del VII Seminario de Ciencias y Tecnologías del Mar. Comisión Colombiana de Oceanografía, CCO. Cali, Octubre-Noviembre 1990: 422-429.
- Perez-Ruzafa, A., C. Marcos, J.J. Bacallado. 1992. Holoturias (Echinodermata: Holothuroidea) de las Islas Canarias: I. Consideraciones generales y Orden Aspidochirota. Rev. Acad. Canar. Cienc., IV (3-4): 139-162.
- Perez-Ruzafa, A., C. Marcos, J.J. Bacallado. 1992. Holoturias (Echinodermata: Holothuroidea) de las Islas Canarias: II. Ordenes Dendrochirota, Elasipodida, Apodida y Molpadida. Rev. Acad. Canar. Cienc., IV (3-4): 163-185.
- Petr, V. (in press). 60th Birthday of Rudolf J. Prokop. Časopis Národního muzea, Řada přírodovědná, (in press).
- Picarra, J.M., J. Le Menn. 1993. Crinoids in the "Estremoz marbles". A contribution to the Ossa Morena stratigraphy. XII Reuniao de Geologia do Oeste Peninsular, Evora. Résumé.
- Pickerill, R.K., S.K. Donovan, H.L. Dixon, E.N. Doyle. 1993. Bichordites monastiriensis from the Pleistocene of southeast Jamaica. Ichnos, 2: 225-230.
- Piepenburg, D., K. v. Juterzenka. (in press). Abundance, biomass and spatial distribution pattern of brittle stars (Echinodermata: Ophiuroidea) on the Kolbeinsey Ridge, north of Iceland. Polar Biology.
- Polson, E.S., L.L. Robbins. 1993. Intraskelatal matrix proteins in Echinodermata. J. Mar. Biol. Ass. U.K. 73, 727-730.
- Prokop, R.J. 1992. Newly ascertained genera of crinoids in the Devonian of Bohemia, Barrandian area. Čas. Nár. Muzea v Praze, Řada přírodověd., 159 (for 1990), No. 1-4: 110. Praha.
- Prokop, R.J. 1993. First find of undoubted skeletal elements of holothurians in the Devonian of Czech Republic. Čas. Nár. Muzea, Řada přírodověd., 161 (for 1992), No. 1-4 45-46. Praha.
- Prokop, R.J., V. Petr. (in press). A note on the phylogeny of scyphocrinitid crinoids. Acta Universitatis Carolinae, Geologica.

Praha.

- Prokop, R.J., V. Petr. (in press). Timocrinus gen. n. (Crinoidea, Inadunata) from the Lower Devonian of Bohemia. Časopis Národního muzea, Řada přírodovědná, 162 (for 1993), No. 1-4.
- Prokop, R.J., V. Petr. (in press). Lecanocrinus Hall, 1852 (Crinoidea, Flexibilia) in the Bohemian Silurian and Lower Devonian. In: R.J. Prokop, V. Petr. New flexible crinoids from the Silurian and Devonian of the Czech Republic. Folia Musei Rerum naturalium Bohemiae occidentalis, Geologica.
- Prokop, R.J., V. Petr. (in press). Taxocrinus sp. (Crinoidea, Flexibilia) in the Middle Devonian of Moravia, Czech Republic. In: R.J. Prokop, V. Petr. New flexible crinoids from the Silurian and Devonian of the Czech Republic. Folia Mus. Rer. natur. Bohem. occident., Geologica.
- Prokop, R.J., V. Petr. (in press). First find of edrioasteroids, Echinodermata, in the Bohemian Devonian, Barrandian area. Čas. Nár. muzea, Řada přírodověd, 163 (for 1994), No. 1-4.
- Reunov, A.A., O.V. Bodrova, M.G. Eliseikina. 1994. Structure of the testis and changes shown during the annual reproductive cycle in Cucumaria japonica (Echinodermata: Holothuroidea). Invertebrate Reprod. Develop., v. 25, N 1: 83-86.
- Robardet, M., J. Blaise, E. Bouyx, R. Gourvennec, H. Lardeux, A. Le Herisse, J. Le Menn, M. Melou, F. Paris, Y. Plusquellec, J. Poncet, S. Regnault, M. Rioult, M. Weyant. 1993. Paleogeography of western Europe from the Ordovician to the Devonian. Bull. Soc. géol. France, t. 163: 683-695.
- Roccatagliata, A.J., M.S. Maier, A.M. Seldes. (in press). Starfish saponins. Part 2. Steroidal oligoglycosides from the starfish Cosmasterias lurida.
- Rochette, R., J.-F. Hamel, J.H. Himmelman. Search, detection and localization of prey by the subtidal asteroid, Leptasterias polaris (Müller and Troschel). (in press). Marine Ecology Progress Series.
- Rodriguez, S.R., F.P. Ojeda. 1993. Distribution patterns of Tetrapygus niger (Echinodermata: Echinoidea) off the central Chilean coast. Marine Ecology Progress Series 101: 157-162.
- Rodriguez, S.R., F.P. Ojeda, N.C. Inestrosa. 1993. Settlement of benthic marine invertebrates. Marine Ecology Progress Series 97: 193-207.
- Roller, R.A., W.B. Stickle. 1993. Effects of temperature and salinity acclimation of adults on larval survival, physiology, and early development of Lytechinus variegatus (Lamarck) (Echinodermata: Echinoidea). Marine Biology 116: 583-591.
- Roman, J., G. Breton, C. Vadon. 1993. Ophiurides et Astéride (Echinodermata) du Tithonien de Canjuers (Var, France). Annales de Paléontologie (Vert.-Invert.), 79, 1, p. 1-18, 4 fig.-texte, 2 pl.
- Rose, E.P.F. 1993. Class Echinoidea. In M.J. Benton (ed.), The Fossil Record 2. Chapman & Hall, London. p. 513-525.
- Rose, E.P.F., N.E. Cross. 1993. The chalk sea urchin Micraster: microevolution, adaptation and predation. Geology Today 9: 179-186.

- Rose, E.P.F., S.K. Pratt, S.M. Bennett. (in press). Evidence for sea-level change in the Globigerina Limestone Formation (Miocene) of the Maltese Islands. *Paleontologia i Evolucio*.
- Rowe, F.W.E., D.T. Anderson, J.M. Healy. 1991. Echinodermata: Concentricycloidea. In Giese, A.C., Pearse, J.S., Pearse, V.B. (eds), *Reproduction of Marine Invertebrates*, Vol. VI. Echinoderms and Lophophorates. pp. 751-760. The Boxwood Press: Pacific Grove, California.
- Rowe, F.W.E., J.M. Healy, D.T. Anderson (1994) Concentricycloidea. In Harrison, F.W., Chia, F.S. (eds). *Echinodermata. Microscopic Anatomy of Invertebrates* vol. 14: (in press).
- Rowe, F.W.E., J. Gates. (in press). *Zoological Catalogue of Australia*, vol. 33. Echinodermata. Aust.Gvt.Publ.Serv., Canberra.
- Schatt, P., J.-P. Féral. 1991. The brooding cycle of Abatus cordatus (Echinodermata: Spatangoida) at Kerguelen Islands. *Polar Biology* 11: 283-292.
- Scheltema, R.S. 1992. Passive dispersal of planktonic larvae and the biogeography of tropical sublittoral invertebrate species. pp. 195-202. In: *Marine eutrophication and population dynamics*. G. Colombo, I. Ferrari, V. Ugo Ceccherelli, R. Rossi (Eds.), Olsen and Olsen, Fredensborg, Denmark, viii + 395 pp.
- Shogomori, H., K. Chiba, M. Hoshi. Non-plasmalemmal localisation of the major ganglioside in sea urchin eggs. *Zygotes* 1: 215-223.
- Smith, A.B., C.W. Wright. 1993. British Cretaceous echinoids. Part 3, Stirodonta 2 Hemicidaroida, Arbacioida and Phymosomatoida 1. *Palaeontographical Society Monographs*, no. 593: 199-267, pl. 73-92.
- Smith, A.B. (in press). *Systematics and the Fossil Record*. Blackwells Scientific Publications, Oxford.
- Smith, A.B. (in press). Rooting molecular trees: problems and approaches. *Biological Journal of the Linnean Society*.
- Stancyk, S.E., H.M. Golde, P.A. Pape-Linstrom, W.E. Dobson. (in press). Born to lose. 1. Measures of tissue loss and regeneration by the brittlestar Microphiopholis gracillima (Echinodermata: Ophiuroidea). *Mar. Biol.*
- Strathmann, R.R. 1993. Hypotheses on the origin of marine larvae. *Annu. Rev. Ecol. Syst.* 24: 89-117.
- Teichert, C., G.D. Webster. 1993. Crinoids in Skwarko, S.K. (ed), *Palaeontology of the Permian of Western Australia*. Geological Survey of Western Australia Bulletin 136, p. 68-72, 322-339, pls. 65-71; microfiche sheet 8, p. 1-26.
- Temara, A., C. De Ridder, J.G. Kuenen, L.A. Robertson. 1993. Sulfide-oxidizing bacteria in the burrowing echinoid, Echinocardium cordatum (Echinodermata). *Mar. Biol.* 115: 179-185.
- Thandar, A.S. 1990. The phylloporid holothurians of southern Africa with the erection of a new genus. *S. Afr. J. Zool.* 25(4): 207-223.
- Thandar, A.S. 1991. The cucumariid holothurians of southern Africa with the erection of a new genus. *S. Afr. J. Zool.* 26(3): 115-139.
- Thandar, A.S. 1992. South African Museum's Meiring Naude Cruises. Holothuroidea. *Annals S. Afr. Mus.* 101(7): 159-180.

- Thandar, A.S. (in press). A new species of the holothurian genus Phyllophorus from South Africa with a key to the subgenus Phyllophorella. J. Zool. London.
- Tuwo, A., C. Conand. 1992. Reproductive biology of the holothurian Holothuria forskali (Echinodermata). J. Mar. Biol. U.K., 72: 745-758.
- Ubaghs, G.J. 1994. Échinodermes Nouveaux (Stylophora, Eocrinoidea) de l'Ordovicien Inférieur de la Montagne Noire (France). Annales de Paléontologie (Invert.-Vert.), vol. 80, fasc. 2, pp. 107-141.
- Ushiyama, A., T. Araki, K. Chiba, M. Hoshi. Specific binding of acrosome reaction-inducing substance to the head of starfish spermatozoa. Zygote 1: 121-127.
- Vadet, A. 1993. Les Oursins du Bathonien et du Bajocien de Normandie. Mem. Soc. Acad. Bal. Tome VI (3-6): 1-106, 11 pls.
- Valentine, J.W., D. Jablonski. 1993. Fossil communities: Compositional variation at many time scales. In: R.E. Ricklefs and D. Schluter, eds., Species diversity in ecological communities: Historical and geographical perspectives. University of Chicago Press, 341-349.
- Van Der Ham, R., M. Van Birgelen. 1992. Maastrichtian echinoids from the Schneeberg and its environment (Aachen, Germany). Natuurhistorisch Maandblad 81 (8-g): 139-153.
- Veggetti, A., F. Mascarello, P.A. Scapolo, A. Rowleron, M.D. Candia Carnevali. 1993. Muscle growth and myosin isoform transitions during development of a small teleost fish, Poecilia reticulata (Peters) (Atheriniformes, Poeciliidae): a histochemical, immuno-histochemical, ultrastructural and morphometric study. Anat. Embryol., 187, 353-361.
- Veggetti, A., F. Mascarello, A. Rowleron, M.D. Candia Carnevali. 1993. Muscle growth and myosin isoform transitions during post natal development of Poecilia reticulata. J. Muscle Res. & Cell Motility, 14, 253.
- Warén, A., D.R. Noris, J. Templado. 1994. Descriptions of four new eulimid gastropods parasitic on irregular sea urchins. Veliger (in press).
- Warén, A., L.M. Lewis. 1994. Two new species of gastropods endoparasitic in asteroids. Veliger (in press).
- Waters, J.A., C.R. Maples, A.S. Horowitz. 1993. Mississippian echinoderms from Alabama - an overview. In J.C. Pashin, ed., New perspective on the Mississippian system of Alabama. A Guidebook for the 30th annual field trip of the Alabama Geological Society, p. 41-50.
- Waters, J.A., A.S. Horowitz. (in press). Ordinal level evolution in the Blastoidea. Lethaea, v. 26.
- Webster, G.D. 1991. Tournaisian and early Visean crinoid faunas of western North America. XIe Congrès International de Stratigraphie et de Géologie du Carbonifère, Beijing 1987, Compte Rendu 2(1989): 376-381.
- Webster, G.D. 1993. Bibliography and index of Paleozoic crinoids, 1986-1990. Geological Society of America Microform Publication 25, 3 cards, p. 1-204.

- Webster, G.D., M.P. Delattre. 1993. Permian crinoid columnals from the Zamora Formation near El Volcan, Baja California Norte, Mexico. Geological Soc. of America Special Paper 279, p. 91-95.
- Webster, G.D., P.A. Jell. 1993. Early Permian inadunate crinoids from Thailand. Memoirs of the Queensland Museum, 33(1): 349-359.
- Wilkie, I.C., M.D. Candia Carnevali, F. Bonasoro. 1992. The ~~compes~~ depressors of Paracentrotus lividus (Lamarck) (Echinodermata: Echinoidea): ultrastructural and mechanical aspects of their variable tensility & contractility. Zoomorphology, 112: 143-153.
- Wilkie, I.C., M.D. Candia Carnevali, F. Andrietti. 1993. Variable tensility of the peristomial membrane of the sea-urchin Paracentrotus lividus (Lamarck). Comp. Biochem. Physiol. 105A: 493-501.
- Wilkie, I.C., R.H. Emson, C.M. Young. 1993. Smart collagen in sea lilies. Nature 366: 519-520.
- Wilkie, I.C., M.D. Candia Carnevali, F. Andrietti. 1994. Micro-architecture and mechanics of the sea-urchin peristomial membrane. Boll. Zool. 61: (in press).
- Wray, G.A. 1994. The evolution of cell lineage in echinoderms. Amer. Zool. (in press).
- Yokota, Y., V. Matranga, F. Zito, M. Cervello, E. Nakano. 1994. Nectins in sea urchin eggs and embryos. J. Mar. Biol. Ass. U.K. 74: (in press).
- Young, T.P., S.K. Donovan. 1993. The eocrinoid Ascocystites Barrande (Echinodermata, Blastozoa) from the Middle Ordovician of central Portugal, with comments on the stratigraphy of the Brejo Fundeiro Formation. Atlantic Geology, 29: 149-154.
- Zavodnik, D. 1990. Additions to Holothuroidea of the Adriatic Sea. Rapp. Comm. int. Mer Médit. 32(1): 38.
- Zavodnik, D. 1992. Actual knowledge on the Rijeka Bay benthic fauna (the North Adriatic Sea). Rapp. Comm. int. Mer Médit. 33: 358.
- Zavodnik, D. 1992. Contributions to marine flora and fauna of the Lošinj Island group. VII. Echinodermata (in Croatian). Otočki ljetopis Cres-Lošinj 8: 257-246.
- Zavodnik, D. 1992. Contributions to marine flora and fauna of the Lošinj Island group. IX. Benthic communities (in Croatian). Otočki ljetopis Cres-Lošinj 8: 273-281.
- Zavodnik, D., N. Zavodnik, J. Vidaković, A. Jaklin, D. Medaković. 1992. Unconventional sea food resources of the Lošinj Island group (in Croatian). Otočki ljetopis Cres-Lošinj 8: 283-292.
- Zavodnik, D., A. Travizi, A. Jaklin. 1994. Phytoplankton bloom consequences on benthic organisms. In: UNEP/FAO: Final reports on research projects dealing with eutrophication problems. MAP Tech. Rep. Ser. No. 78, UNEP, Athens, pp. 91-120.
- Zeidler, W. 1992. Introduced starfish pose threat to scallops. Australian Fisheries 51(10): 28-29.
- Zeller, R.W., R.A. Cameron, R.R. Franks, R.J. Britten, E.H. Davidson. 1992. Territorial expression of three different trans-genes in early sea urchin embryos by a whole-mount fluorescence procedure. Dev. Biol. 151: 382-390.

FOSSIL CRINOID COLLECTIONS
AT
THE NATIONAL MUSEUM OF NATURAL HISTORY
SMITHSONIAN INSTITUTION

Visitors to the National Museum of Natural History's Department of Paleobiology fossil crinoid collections, housed in the Springer Room, will find some changes. Tom Kammer and Bill Ausich are in the process of curating selected portions of those collections; the project is expected to be completed in 1995.

The Department's holdings of fossil crinoids are housed in four main collections, 1. type, 2. biologic, 3. special (e.g., Budenbach), and 4. miscellaneous. Our efforts are being concentrated on the biologic and miscellaneous collections.

The crinoid biologic collection was arranged in the systematic scheme of Wachsmuth and Springer (1881-1886); many generic identifications had not been updated. When our task is completed, the biologic collection will be in the systematic order of the Treatise on Invertebrate Paleontology and specimen identifications updated to the best of our ability.

The miscellaneous collections are stored throughout the Springer Room in small units of specimens related to each other by locality, collector, identification, etc. The majority of those specimens will be consolidated into a single, stratigraphically organized collection to facilitate access; the remaining specimens will have their identifications updated and be integrated into the crinoid biologic collection.

Similar curation for other Springer Room collections has been performed (e.g., Post Paleozoic Echinoid Collection by Andrew Smith, Blastoid Biologic Collection by Alan Horowitz and Johnny Waters). The Department of Paleobiology houses some of the finest collections of fossil echinoderms in the world and these improvements will further secure their value to science and public programs.

W.I. Ausich

PAPERS PRESENTED AT MEETINGS

8TH INTERNATIONAL ECHINODERM CONFERENCE, DIJON, FRANCE, September 6-10, 1993. Proceedings of the 8th International Echinoderm Conference, Dijon, France, 1993: In: B. David et al. (eds.). Echinoderms: Dijon. Balkema Press, Rotterdam.

- Ameziane-Cominardi, N., M. Roux. Mosaic pattern of ontogeny in modern stalked crinoids. Consequences for evolutionary paleontology and taxonomy.
- Baumiller, T.K. Patterns of extinction and faunal dominance in the record of Paleozoic crinoid genera.
- Birenheide, R., S. Amemiya, T. Motokawa. Video observations of the movements of the stalked crinoid *Metacrinus rotundus* (Echinodermata, Crinoidea).
- Birenheide, R. T. Motokawa, S. Amemiya. Morphology and biomechanics of the "problematical" ligament in the arm of *Metacrinus rotundus*.
- Bonasoro, F., M.D. Candia Carnevali. Chordoid structures in regular sea urchins.
- Byrne, M., M.J. Anderson. Hybridisation of sympatric *Patiriella* species in New South Wales.
- Candia Carnevali, M.D., I.C. Wilkie, F. Bonasoro. Structural and mechanical aspects of the mouth-frame of the brittlestar *Ophioderma longicaudum* (Retz.)
- Cerra, A., M. Byrne. Ultrastructure of wrinkled blastula formation in the asteroid *Patiriella exigua*.
- Cobb, J.L.S., K.M. Begbie. Aspects of the hyponeural nervous system of the brittlestar, *Ophiura ophiura*.
- Cross, N.E., E.P.F. Rose. Predation of the Upper Cretaceous spatangoid echinoid *Micraster*.
- De Ridder, C. Symbiosis with sulfo-oxidizing bacteria in spatangoids: a possible pass for fine-grained sediments ?
- De Ridder, C. Symbioses between spatangoids (Echinoidea) and the Thiothrix-like bacteria (Beggiatoales).
- Drummond, A.E. Aspects of the life history biology of three species of sea urchin on the South African east coast.
- Foltz, D.W., W.B. Stickle Jr. Genetic structure of four species in the *Leptasterias hexactis* complex along the Pacific coast of North America.
- Grigolava, I., J.D. McKenzie. Biochemical studies of echinoderm surface coats using radiolabelling techniques.
- Hamel, J.-F., A. Cabanac, J.H. Himmelman. Morphological adaptations of the sand dollar *Echinarachnius parma*.
- Hamel, J.-F., A. Mercier. Behavioural response of the basket star *Gorgonocephalus arcticus* in reaction to mechanical stimulation.
- Hamel, J.-F., A. Mercier. Influence of environmental factors on pre-spawning behaviour and spawning and developmental biology of the brooding starfish *Leptasterias polaris*.
- Hamel, J.-F., G. Desrosiers. Larval fixation and small scale migration of the sea cucumber *Cucumaria frondosa*.

- Heinzeller, Th., N. Ameziane-Cominardi, U. Welsch. Light and electron microscopic studies on arms and pinnules of the cyrtocrinid *Gymnocrinus richeri*.
- Jagt, J.W.M., R.W.J.M. Van Der Ham. Early Palaeocene marsupiate regular echinoids from NE Belgium and SE Netherlands. (poster).
- Kelly, M., J.D. McKenzie, M. Barker. Sub-cuticular bacteria: their incidence in the echinoderms of the British Isles and New Zealand.
- King, C.K., O. Hoegh-Guldberg, M. Byrne. The reproductive cycle of the sea urchin *Centrostephanus rodgersii* in New South Wales.
- Klinger, T.S., C.R. Johnson, J. Fell. Sediment utilization, niche breadth, and niche overlap of Aspidochirotida (Echinodermata: Holothuroidea) in the lagoon and reef flat of Heron Island, Great Barrier Reef.
- Lawrence, J.M., M. Byrne. Allocation of resources to body components in *Heliocidaris erythrogramma* and *Heliocidaris tuberculata* (Echinodermata: Echinoidea).
- Lawrence, J.M., M. Byrne. A comparison of the sizes and proximate composition of *Heliocidaris erythrogramma* and *H. tuberculata*.
- Lawrence, J.M., J.B. McClintock. Energy acquisition and allocation by echinoderms in polar seas: adaptations for success?
- LeClair, E.E. Quantitative morphological and microstructural variation in the vertebral ossicles of the Ophiurida (Ophiuroidea).
- Le Menn, J. Importance of columnals in the reconstruction of Paleozoic crinoid communities.
- Liao, Y., A.M. Clark. An introduction to the echinoderms of southern China.
- Litvinova, N.M. The life forms of Ophiuroidea (based on the morphological structures of their arms).
- Lumingas, L., M. Guillou. Plasticité de l'oursin, *Sphaerechinus granularis* (Lamarck), face aux variations de l'environnement.
- Marsh, L.M. Echinoderms of the Houtman Abrolhos Islands, Western Australia and their relationship to the Leeuwin Current.
- McKenzie, J.D. Using the very small to comment on the very large: can ultrastructure be of use in phylogeny?
- Messing, C.G. Comatulid crinoids of Madang, Papua New Guinea, and environs: diversity and ecology.
- Messing, C.G. Crinoid meadows of the West Indies: distribution, responses to flow, disarticulation, sediment production and taphonomy.
- Moloney, P., M. Byrne. Oogenesis in the ophiuroid *Ophionereis schayeri*.
- Nakamura, R.K. Going with the flow: hydrodynamic limits to the distribution of the Pacific sand dollar, *Dendraster excentricus*.
- Nebelsick, J.H., S. Kampfer. Taphonomy of *Clypeaster humilis* and *Echinodiscus auritus* (Echinoidea, Clypeasteroidea).
- Oji, T., T. Okamoto. Evolution of arm autotomy and arm branching pattern in stalked and stalkless crinoids.
- Penchaszadeh, P.E. Population ecology of the sand dollar *Mellita quinquiesperforata latiaambulacra* Clark, 1940 on the west-central coast of Venezuela.

- Rochette, R., J.-F. Hamel, J.H. Himmelman. Search, detection and localization of prey by a subtidal asteroid, *Leptasterias polaris* (Müller and Troschel).
- Reunov, A.A., A.N. Hodgson. An ultrastructural investigation of spermatogenesis and sperm structure in six species of South African sea urchin.
- Rose, E.P.F. First and last occurrence of echinoid families and the nature of their fossil record.
- Schoppe, S., A. Holl. *Ophiothrix* n.sp. (Ophiuroidea: Ophiotrichidae) from Colombia, a protandric hermaphrodite that broods its young.
- Stancyk, S.E., R.B. Aronson, W.E. Dobson, R.J. Feller, J.D. McKenzie. Predation and regeneration of *Ophiura sarsi* on the U.S. continental slope: use of a manned submersible to perform in situ experiments.
- Stewart, B.G., P.V. Mladenov. Aspects of the reproduction and anatomy of the euryalinid snake star *Astrobrachion constrictum*.
- Stickle, W.B., Jr., D.W. Foltz. Habitat affinities of species in the *Leptasterias hexactis* complex along the Pacific coast of the continental United States.
- Thandar, A.S. 1993. A new species of the holothuroid genus *Phyllophorus* from South Africa.
- Thandar, A.S. 1993. Character divergence and cladistic relationships of the southern African genera and subgenera of the family Holothuriidae.
- Thierry, J., D. Néraudeau. Variations in Jurassic echinoid biodiversity of ammonite zone levels: stratigraphical and palaeobiological implications.
- Tsuchi, A., R. Birenheide, T. Motokawa. Nervous control of the mechanical properties of the tooth support in echinoids.
- Tuwo, A., C. Conand. 1993. Fecundity of three temperate holothurians with pelagic development.
- Wasson, K.M., T.S. Klinger. Changes in nucleic acid levels in the gut of *Strongylocentrotus droebachiensis* (Echinoidea) and the pyloric caeca of *Asterias forbesi* (Asteroidea) in conjunction with the annual reproductive cycle.
- Wray, G.A. Larval morphology and echinoderm phylogeny.

XII CONGRESO NACIONAL DE ZOOLOGÍA. SOCIEDAD MEXICANA DE ZOOLOGÍA Y UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN. MÉXICO. MONTERREY, N.L. MÉXICO, DECEMBER 7-11, 1993.

- Anzo Martínez, A.D., F.A. Solís-Marín. Los ofiuroideos (Echinodermata: Ophiuroidea) de la Pedregosa Grande, municipio de Zihuatanejo, Guerrero, México.
- Buitrón Sánchez, B.E., F.A. Solís-Marín. Distribución de *Meoma ventricosa grandis* Gray, 1851 (Echinodermata: Brissidae) en la región occidental de México.
- Ramírez Murillo, R., F.A. Solís-Marín, X.M. Alvares. Asteroideos (Echinodermata: Asteroidea) en dos áreas de Zihuatanejo, Guerrero.

Solís Marín, F.A., J. Torres Vega, A.D. Anzo Martínez. Ofiuroideos (Echinodermata: Ophiuroidea) comensales de la esponja *Axinella* sp. en la Bahía de Zihuatanejo, Guerrero.
Solís Marín, F.A. Presencia de *Molpadia intermedia* (Echinodermata: Holothuroidea) en las costas de México.

1993 ANNUAL MEETING OF THE AMERICAN SOCIETY OF ZOOLOGISTS -- LOS ANGELES, CALIFORNIA, 26-30 December, 1993. Abstracts in: *American Zoologist* 33 (5), 1993. (communicated by J. Lawrence).

- Beardsley, A.M., J.M. Colacino, R. Cashon, C.J. Bonaventura. The hemoglobins of the brittle star, *Hemipholis elongata* (Say) (Ophiuroidea: Echinodermata). Biochemical and ligand binding properties. 43A
- Birenheide, R., S. Amemiya, T. Motokawa. Morphology and mechanics of the arm ligament in a stalked crinoid *Metacrinus rotundus*. 115A
- Bishop, C.D., S.A. Watts. Osmolarity and ion concentrations in the fluid compartments of *Lytechinus variegatus* in varying salinities. 48A
- Bryan, P.J., D. Rittschof, J.B. McClintock. Antifoulants from echinoderms. 127A
- Carroll, A.K., J.M. Shick. Dietary accumulation of the uv-absorbing compounds in the ovaries of the green sea urchin. 62A
- Eernisse, D.J., R.A. Strathmann. What molecular phylogenies tell us about the evolution of larval forms. 136A (echinoderms)
- Ellers, O. A mechanical, developmental morphospace classifies shapes of camarodont echinoids. 71A
- Emlet, R.B. Functional requirements and structural patterns in the evolution of nonfeeding larval forms among echinoderms. 137A
- Herrera, J.C. Body form and skeletal growth in larvae of the sea urchin *Lytechinus variegatus* in response to differences in diet. 118A
- Hines, G.A., J.B. McClintock, S.A. Watts. Water-soluble compounds (pheromones?) are produced by echinoderms. 70A
- Hines, G.A., S.A. Watts. Potential endocrine capability of echinoderm coelomocytes. 9A
- Hoegh-Guldberg, O., J.S. Pearse. Food availability, temperature and the development of marine invertebrate larvae. 101A
- Jonsen, S. Polarization sensitivity in *Ophiidermata brevispinum*. 69A
- Kier, W.M., R.S. McCurley. The functional morphology of starfish tube feet: the role of a crossed fiber array in movement. 115A
- Klinger, T.S., J.B. McClintock, S.A. Watts. Chymotrypsin and α - and β -glucosidase activity of digestive tissues of echinoderms of Antarctica and the Gulf of Mexico. 50A
- Lares, M.T., J.M. Lawrence. The effects of feeding periodicity of *Echinometra lucunter* (Echinodermata: Echinoidea). 51A
- Levin, P.S., M.E. Hay. Fish-urchin-seaweed interactions on rocky reefs in North Carolina. 20A
- Medeiros-Bergen, D.E. Loss of larvae to alongshore transport: an

- important source of inter-annual recruitment variation?
(Cucumaria) 109A
- Pearse, J.S. Five rays or six: does it make any difference in potential fecundity of sea stars? 72A
- Pearse, V.B., J.S. Pearse. How are the living classes of echinoderms related and where do concentricycloids fit in? 71A
- Sewell, M.A. Mortality of pentaculæ during intraovarian brooding in the sea cucumber *Leptosynapta clarki*. 110A
- Shick, J.M., W.C. Dunlap, R.M. Larsen. Coral reef holothuroids (Echinodermata) accumulate uv-photoprotectants from their diets. 62A
- Stickle Jr., W.B., D.W. Foltz. Distribution of species in the *Leptasterias hexactis* complex from the west coast of the continental United States. 47A
- Strathmann, R.R. Peculiar constraints on life histories imposed by protective or nutritive devices for embryos. 101A
- Stricker, S.A. Calcium transients during starfish oocyte maturation. 72A
- Swezey, R., B. Rees. Are calcium-mediated redox changes involved in sea urchin egg activation at fertilization? 100A
- Szulgit, G., J. Trotter, T. Koob. Glycosaminoglycans in the ligaments of the pencil urchin *Eucidaris tribuloides*. 35A
- Vidal, A.M., C. Sierra, D.S. Smith, J. del Castillo. Contractile properties of the articular capsular capsule or ligament, in the primary spines of the sea urchin *Eucidaris tribuloides*. 35A
- Watts, S.A., G.A. Hines, J.B. McClintock, K.R. Marion, T.S. Hopkins. 5 α -reductase activity during androgen synthesis in echinoderm tissues. 122A

64TH ANNUAL MEETING OF THE ZOOLOGICAL SOCIETY OF JAPAN, OKINAWA, 20-23 November 1993. Abstracts in Zoological Science Vol. 10, Supplement. 1993.

- Asami, K., Y. Miyashita, N. Sawada. Arrest of development of sea urchin embryos by histone deacetylase inhibitors. p. 32.
- Birenheide, R., T. Motokawa, S. Amemiya. Arm and stalk movements of the crinoid *Metacrinus rotundus*. p. 171.
- Birenheide, R., T. Motokawa, S. Amemiya. Functional morphology of an elastic ligament in the arm of the stalked crinoid *Metacrinus rotundus*. p. 171.
- Chiba, K., H. Abe, S. Tanuma, M. Hoshi. Involvement of protein poly(ADP-ribosyl)ation during meiosis reinitiation in starfish oocytes. p. 64.
- Furuya, S., Y. Kamata, M. Okuyama, I. Yasumasu. [ADP-ribosyl]ation of histones in nuclei isolated from sea urchin embryos. p. 32.
- Hamaguchi, Y. Effects of DNA breakage on cleavage division of sea urchin eggs. p. 29.
- Horiguchi, T., K. Ohsumi, T. Kishimoto. Possible involvement of histone H1 in the regulation of DNA replication rate. p. 28.
- Iuchi, Y., K. Yamada, K. Akasaka, H. Shimada. An element in first intron is needed for increased expression of the arylsulfatase

- (Ars) gene of sea urchin (*H. pulcherrimus*) embryo. p. 33.
- Iwakoshi, E., T. Takahashi, Y. Muneoka, T. Ikeda, H. Minakata, K. Nomoto. Bioactive peptides in the sea cucumber *Stichopus japonicus* -- a preliminary report. p. 89.
- Jujiwara, A., I. Yasumasu. Inhibition of fertilization envelope hardening and hyaline layer formation by SCN- and ClO₄ in sea urchin eggs. p. 73.
- Kajihara, K., H. Fujisawa, S. Amemiya. Scanning electron microscopical studies on the larval development of a sand dollar, *Peronella japonica*. p. 59.
- Kamata, Y., T. Tojo, A. Fujiwara, S. Furuya, I. Yasumasu. Participation of ADP-ribosylated protein in Ca²⁺-induced exocytosis of cortical granule in sea urchin eggs. p. 72.
- Kanda, M., A. Fujiwara, K. Mitunaga-Nakasubo, I. Yasumasu. Analysis of proto-oncogene expression during early development in embryos of sea urchin. p. 31.
- Kawamoto, M., Y. Yasumasu. Partial purification & characterization of a casein-kinase 2-type protein kinase from sea urchin. p. 34.
- Kawashita, H., K. Yamazaki, T. Okamura, M. Asami, K. Mitsunaga-Nakatsubo, I. Yasumasu. Sequence analysis of cation transport ATPases in embryos of sea urchin *Hemicentrotus pulcherrimus*. p. 9.
- Kettoku, M., M. Sato, M. Kanda, K. Mitsunaga-Nakasubo, A. Fujiwara, I. Yasumasu. Okadaic acid inhibits nucleus protein binding to 5' upstream of early embryonic histone H3 gene in sea urchin morulae. p. 32.
- Kinoshita, T. Inductive interaction in germ layer formation of sea urchin embryos. p. 59.
- Kitai, N., H. Kobayashi, T. Fukada, Y. Myotoishi, S. Ikegami. Hatching enzyme-susceptible component of the fertilization membrane of the egg of the *Hemicentrotus pulcherrimus*. p. 34.
- Kojima, M.K., M. Asai, S. Nakamura. Effects of blastocoelic substances of gastrulae cultured in SO₄ 2- free sea water on spicule formation in isolated micromere descendant cells of sea urchin embryos. p. 37.
- Komatsu, M., M. Kawai, Y.D. Noda, M. Dan-Sohkawa, C. Oguro. Correlation of the left coelomic vesicle in bipinnaria, with a consideration to the relation to developmental type of asteroids. p. 175.
- Komatsu, M., H. Tominaga, C. Oguro. Development of the sea-star, *Henricia pachyderma*. p. 175.
- Komatsu, M., M. Sugiyama, Y.T. Kano. Larval development and metamorphosis of the sea star, *Astropecten polyacanthus* Müller and Troschel. p. 176.
- Komatsu, M., M. Kawai, C. Oguro. The development of the seastar, *Asterias amurensis* Lutken, with a consideration to the systematic relation to *A. amurensis versicolor* Sladen. p. 176.
- Komatsu, M., K. Tanka, C. Oguro, P.M. O'Loughlin. A preliminary report on the reproduction and development of the gastric brooding seastar, *Smilasterias multipara* O'Loughlin & O'Hara. p. 176.
- Kominami, T. Establishment of the bilateral asymmetry in starfish larvae. p. 58.
- Kuno, S., T. Nagura, I. Yasumasu. Insuline-binding capacity of micromere-derived cells of sea urchin embryos. p. 36.

- Kuroda, R., M. Fukuda, H. Kuroda, S. Nakade, K. Mikoshiba. Biochemical and immunological characterization of inositol trisphosphate receptor from sea urchin eggs. p. 72.
- Matsumoto, Y., T. Kasahara, S. Ikegami. A protein kinase from starfish oocytes having affinity with double-stranded RNA. p. 64.
- Matsushita, S. Fate mapping study of the endoderm of the 1.5 day-old chick embryo. p. 50.
- Minokawa, T., K. Kajihara, H. Fujisawa, S. Amemiya. Twin larvae of the sand dollar, *Astriclypeus manni*. Their potency to develop the echinus rudiment. p. 59.
- Mishima, M., I. Mabuchi. Phosphorylation of myosin light chain in fertilized sea urchin eggs. p. 21.
- Mita, M., A. Oguchi, S. Kikuyama, I. Yasumasu, R. De Santis, M. Kakamura. Endogenous substrates of the sea urchins *Arbacia lixula* and *Paracentrotus lividus*. p. 70.
- Miyazaki, A., E. Kamitsubo, S. Nemoto. Cytoskeletons responsible for the localization of germinal vesicles in the animal pole region of starfish oocytes: a centrifuge microscopic study. p. 31.
- Mogami, Y., J. Ishii, S.A. Baba. Gravitaxis of sea urchin larvae: changes in mechanical properties during development. p. 97.
- Nakagawa, T., A. Jujiwara, I. Yasumasu. Non-dialyzable compounds extracted from sea urchin embryos with chaotrophic ions produce abnormal embryos. p. 36.
- Nakasone, M., M. Kettoku, I. Yasumasu. Regulation of early embryonic histone gene expression in sea urchin by DNA methylation. p. 32.
- Nishigaki, T., K. Chiba, W. Miki, M. Hoshi. Purification and sequencing of sperm activating peptides in the jelly coat of starfish, *Asterias amurensis*. p. 70.
- Nishimura, A., K. Hijikata, K. Yamada, K. Takata, K. Akasaka, H. Shimada. Gene-transfer into sea urchin embryos with particle gun. p. 33.
- Noguchi, T., R. Matsuda, I. Mabuchi. The effects of tyrosine kinase inhibitors on early development of sea urchin embryos. p. 34.
- Nomura, A. PCNA during the first cell cycle in the fertilized eggs of starfish, *Asterina pectinifera*. p. 29.
- Nomura, A., S. Nemoto. Timing of DNA replication periods in starfish (*Asterina pectinifera*) eggs activated by the calcium ionophore. p. 29.
- Nomura, K., N. Suzuki. Structure of sea urchin hatching enzyme and the mechanism of fertilization envelope dissolution. p. 34.
- Ohta, K., Nakazawa, T. Cloning and sequencing of cyclophilin cDNA in sea urchin, *Hemicentrotus pulcherrimus*. p. 9.
- Satoh, S.K., Y. Hamaguchi. Effects of camptothecin on cleavage division of sea urchin eggs. p. 30.
- Seki, T., K. Seki. Observation of phagocytosis of echinoderm phagocyte on bacterial thin-layer in vitro. p. 84.
- Shimizu, T., S. Horiike, S. Ikegami. New histone molecules produced at the blastula stage of starfish embryos. p. 31.
- Shingyoji, C., K. Yoshimura, D. Eshel, I.R. Gibbons, K. Takahashi. Effect of outer dynein arm extraction and recombination on the velocity of microtubule sliding in reactivated sea urchin sperm flagella under imposed head vibration. p. 98.

- Saotome, K. Karyotypic comparison of the sea urchin, *Pseudocentrotus depressus* with 3 species of echinoids belonging to the family Strongylocentrotidae. p. 175.
- Tachibana, K., T. Okano, T. Sekiai, K. Ookata, T. Kishimoto. Cell cycle dynamics of cyclins A and B during meiotic and early cleavage cycles in starfish. p. 28.
- Taguchi, K., S. Nakamura, M.K. Kojima. Effects of seeral mitotic inhibitors on cleavage of urethane-treated eggs of sea urchin. p. 31
- Takagi Sawada, M., K. Izumi. High-molecular weight proteases in the ovary of starfish. p. 44.
- Takahashi, K., T. Mito. Bidirectional transport in sea urchin madreporite. p. 99.
- Tanaka, S., K. Yamada, K. Akasaka, H. Shimada. Purification of G-string binding proteins that interact with transcriptional regulatory element of sea urchin arylsulfatase (Ars) gene. p. 33.
- Teramura, W., T. Shimizu, S. Ikegami, H. Kaneko, M. Dan-Sohkawa. Ontogeny and characterization of extra-cellular matrix antigens in starfish antigens. p. 37.
- Tobita, T., T. Ishimoda-Takagi. Changes in sea urchin egg tropomyosin during fertilization and development. p. 43.
- Tojo, T., Y. Kamata, A. Fujiwara, I. Yasumasu. Ca^{2+} signaling is not necessary for fertilization membrane formation by melittin in sea urchin eggs. p. 73.
- Tosuji, H., I. Mabuchi. Increase in histone H1 kinase activity and condensation of chromosomes in unfertilized sea urchin eggs induced by calyculin A in an MPF-independent manner. p. 21.
- Wada, Y., Y. Mogami, S.A. Baba. A new type of motile response of cilia of echinopluteus. p. 98.
- Wada, H., N. Satoh. Phylogenetic analysis of deuterostomes. On the evolutionary history from invertebrates to vertebrates. p. 179.
- Yamada, K., K. Akasaka, H. Shimada. In vitro transcription of sea urchin (*Hemicentrotus pulcherrimus*) arylsulfatase gene. p. 33.
- Yamaguchi, M. Fractionation of macromeres, mesomeres & micromeres of the 16 cell-stage sea urchin embryos by centrifugal elutriation. p. 36.
- Yamazaki, K., H. Kawashita, C. Okamura, M. Asami, I. Mitsunaga-Nakatsubo, I. Yasumasu. Identification of Na^{+}/K^{+} -ATPase alpha-subunit isoforms of sea urchin *Hemicentrotus pulcherrimus*. p. 9.
- Yazaki, I. Metamorphosis in sea urchins induced by L-glutamine. p. 59.
- Yokota, Y., K.H. Kato, E. Nakano. Intracellular distribution and secretion into the hyaline layer of an extracellular matrix protein of sea urchin, *Temnopleurus hardwicki*. p. 38.
- Yoshida, S., T. Shimizu, Y. Hashimoto, R. Matsuda, H. Katow. Spatial distribution and role epitope of primary mesenchyme cell (PMC) - specific monoclonal antibody (P4) in embryo of the sand dollar, *Clypeaster japonicus*. p. 37.
- Yoshizato, K., S. Amemiya. Characterization of collagen of the stalk of sea lily, *Metacrinus rotundus*. p. 13.

1992 ANNUAL MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA --
CINCINNATI, OHIO, October 26-29, 1992. Geological Society of
America Abstracts with Program 24(7). (communicated by W.I.
Ausich).

- Ausich, W.I., T.W. Kammer. Biogeography and evolution among late
Osagean-early Meramecian (Lower Mississippian) crinoids in the
east-central United States.
- Baumiller, T.K. Major extinction events in the record of Paleozoic
crinoids: new metrics for measuring extinction intensities.
- Bodenbender, B.E. Blastoid phylogeny: morphological and
crystallographic evidence.
- Dixon, H.L., S.K. Donovan. The upper Oligocene Echinoidea of
Jamaica.
- Holterhoff, P.F. Heterochronic ecophenotypes and distribution
patterns of *Delocrinus subhemisphericus* in Upper Missourian
cyclic sequences, midcontinent, North America.
- Kendrick, D.C. Crinoid arm branching topology, pinnulation, and
the convergence of crinoid arm designs.
- Sprinkle, J., T.E. Guensburg. Tiering history of suspension
feeders on hard substrata.
- Webster, G.D., P.A. Jell. Permian holdovers and the world's
youngest Paleozoic crinoids from western Australia.

FIELD TRIP -- The post-meeting field trip "Fort Payne Carbonate
Facies of South-Central Kentucky" led by D.L. Meyer and W.I.
Ausich was a fossil echinoderm feast for all those who attended.

1993 SOUTH-CENTRAL SECTION OF THE GEOLOGICAL SOCIETY OF AMERICA --
FORT WORTH, TEXAS, March 15-16, 1993. Geological Society of
America Abstracts with Program 25(1). (communicated by W.I.
Ausich).

Wernlund, R.J. A monotypic model for Late Paleozoic holothurian
sclerites.

1993 NORTHEASTERN SECTION OF THE GEOLOGICAL SOCIETY OF AMERICA --
BURLINGTON, VERMONT, March 24-26, 1993. Geological Society of
America Abstracts with Program 25(2). (communicated by W.I.
Ausich).

- Brower, J.C. Paleoecology of a Middle Ordovician Pleurocystitid-
crinoid community from the midcontinent.
- Taylor, W.L., C.E. Brett. Taphonomy and paleoecology of Silurian
(Wenlockian) fossil-Lagerstätten from western New York and
southern Ontario.

1993 NORTH-CENTRAL SECTION MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA -- ROLLA, MISSOURI, March 29-30, Geological Society of America Abstracts with Program 25(3). (communicated by W.I. Ausich).

Ausich, W.I., D.L. Meyer. *Eretmocrinus* from the Lower Mississippian Fort Payne Formation of South-Central Kentucky - can we recognize hybrid specimens in the fossil record?

1993 SOUTHEASTERN SECTION MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA -- TALLAHASSEE, FLORIDA, April 1-2, Geological Society of America Abstracts with Program 25(4). (communicated by W.I. Ausich).

Oyen, C.W. Evolution and heterochrony in Neogene echinoids (Family Mellitidae) from the Gulf and Atlantic Coastal Plains.

1993 JOINT CORDILLERAN SECTION AND ROCKY MOUNTAIN SECTION MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA -- RENO, NEVADA, May 19-21, Geological Society of America Abstracts with Program 25(5). (communicated by W.I. Ausich).

Sprinkle, J., T.E. Guensburg. Between evolutionary faunas: comparison of Late Cambrian and Early Ordovician echinoderms and their paleoenvironments.

1993 ANNUAL MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA -- BOSTON, MASSACHUSETTS, October 25-28, 1993. Geological Society of America Abstracts with Program 25(6). (communicated by W.I. Ausich).

Ausich, W.I., G.D. Sevastopulo. Physical environmental and biologically mediated controls on the preservation of crinoids (Tournaisian; Co. Wexford, Ireland).

Baumiller, T.K., G. Llewellyn, C.G. Messing, W.I. Ausich. Autotomy and taphonomy of isocrinid stalks. A105.

Bodenbender, B.E. Crystallographic patterns in blastoid skeletal elements.

Carter, B.D., M.M. Azab. Substrate availability as a primary control on echinoid diversity.

Fisher, D.C. Life orientation of mitrate stylophorans and its implications for the calcichordate theory of vertebrate origins.

Foote, M. Morphological disparity in Ordovician through Devonian crinoids.

Greenstein, B.J., J.M. Pandolfi. Taphonomic biasing of populations

- of crown-of-thorns starfish: Implications for recognizing past outbreaks in the reef sedimentary record.
- Guensburg, T.E., J. Sprinkle. Edrioasteroid phylogeny.
- Kammer, T.W., W.I. Ausich. Did facies specialists evolve more rapidly than facies generalists in Early Carboniferous crinoids?
- Kendrick, D.C. Computer modelling of crinoid calyx morphologies and comparisons with real forms.
- Lane, N.G., J.A. Waters, S.A. Marcus, C.G. Maples. Paleozoic echinoderms from the People's Republic of China: A video presentation of field and laboratory studies in May 1993.
- Llewellyn, G., T.K. Baumiller. Stem growth strategies for two Western Atlantic isocrinid species. A104-A105.
- Messing, C.G. Depth, current flow and morphological variations among living crinoids. A104.
- Oyen, C.W. Mosaic patterns of heterochrony in fossil mellitids from Florida and the role of ecology in evolution of Cenozoic echinoids.
- Suter, S.J. Stratigraphic ranges as a basis for choosing among equally parsimonious phylogenies: the case of cassiduloid echinoids.
- Waters, J.A., C.G. Maples, N.G. Lane, S.A. Marcus, Z.T. Liao. A camerate dominated Late Carboniferous (Moscovian) crinoid fauna from a subaqueous pyroclastic conglomerate, northwestern People's Republic of China.

1994 NORTH-CENTRAL SECTION MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA, KALMAZOO, MICHIGAN, April 28-29. Geological Society of America Abstracts with Program 26(3). (communicated by William I. Ausich).

- Ausich, W.I., T.K. Baumiller. Crinoid stalk flexibility determined from preserved sutures (Lower Mississippian, Echinodermata).
- Blake, D.B. Asteroids and taphonomy: Observations and implications.
- Donovan, S.K., B.J. Embden. Pleistocene echinoids of Jamaica.
- Donovan, S.K., R.K. Pickerill. Crinoid columns preserved in an upright position in the Upper Silurian of Nova Scotia: Taphonomic implications.
- Taylor, W.L., C.E. Brett. Tiered taphonomy: Examples from the Rochester Shale (Silurian, Wenlockian) of western New York and southern Ontario, Canada.

1994 SOUTHEASTERN SECTION MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA, BLACKSBURG, VIRGINIA, APRIL 7-8. Geological Society of America Abstracts with Program 26(4). (communicated by William I. Ausich).

- Oyen, C.W., R.W. Portell. Diversity changes in Cenozoic echinoids of Florida and a comparison with molluscan diversity patterns.

CONFERENCES (by region)

CANADA

- Cabanac, A., J.-F. Hamel, J.H. Himmelman. 1992. Morphological adaptation of the sand dollar *Echinarachnius parma* to facilitate righting itself. SQEBC (Société Québécoise des Etudes de la Biologie du Comportement), XVIIth congrès annuel, Université du Québec à Montréal, Québec.
- Hamel, J.-F. 1992. Relation between reproductive cycle of the sea cucumber *Psolus fabricii* (Düben and Koren) and environmental conditions. 31th Canadian Zoological Societies of Canada, Antigonish (Nova-Scotia), Canada.
- Hamel, J.-F., G. Desrosiers. 1993. Long term developmental biology of the sea cucumber *Cucumaria frondosa*. 32th Canadian Zoological Societies of Canada, Guelph, Ontario, Canada.
- Hamel, J.-F., J.H. Himmelman. 1993. Dimorphisme sexuel de l'oursin plat *Echinarachnius parma*. 61th congrès ACFAS, UQAR, Rimouski, Canada.
- Hamel, J.-F., A. Mercier. 1993. Prespawning and spawning sexual interaction and developmental biology of the brooding starfish *Leptasterias polaris*. 32th Canadian Zoological Societies of Canada, Guelph, Ontario, Canada.
- Hamel, J.-F., A. Mercier. 1993. Prespawning and spawning sexual interaction and developmental biology of the brooding starfish *Leptasterias polaris*. 61th congrès ACFAS, UQAR, Rimouski, Canada.
- Hamel, J.-F., A. Mercier. 1993. Comportement de l'ophiure *Gorgonocephalus arcticus* en réaction à une stimulation mécanique. 61th congrès ACFAS, UQAR, Rimouski, Canada.
- Mercier, A., J.-F. Hamel. 1993. Behavioural response of the basket star *Gorgonocephalus arcticus* in reaction to mechanical stimulation. 32th Canadian Zoological Societies of Canada, Guelph, Ontario, Canada.
- Mercier, A., J.-F. Hamel. 1993. Adaptation morphologique des podia et du corps de trois espèces d'astéroïdes au substrat. 61th congrès ACFAS, UQAR, Rimouski, Canada.
- Mercier, A., E. Pelletier, J.-F. Hamel. Metabolism and toxicity of butyltin compounds in Asteroids. 20th Aquatic Toxicologic Annual Conference, Québec (Québec), Canada.
- Mercier, A., E. Pelletier, J.-F. Hamel. 1993. Metabolism and toxicity of butyltin compounds in starfish. 1th Forum Québécois en Science Marines, Rimouski (Québec), Canada.
- Rochette, R., J.-F. Hamel, J.H. Himmelman. 1992. Rheotaxis and olfaction in a subtidal seastar *Leptasterias polaris* (Müller and Troschel) and suggested relation to foraging strategy. SQEBC (Société Québécoise des Etudes de la Biologie du Comportement), XVIIth congrès annuel, Université du Québec à Montréal, Québec.

EUROPE

- Nebelsick, J.H. Taphonomy of Red Sea Clypeasteroid echinoids. First European Regional Meeting of the International Society for Reef Studies, Vienna, Austria.
- Nebelsick, J.H. The uses and limitations of actuopalaeontological investigations on echinoids. First European Palaeontological Congress, Lyon, France.
- Gluchowski, E., H. Hagdorn. Palaeobiogeography and stratigraphy of Muschelkalk echinoderms (Crinoidea, Echinoidea) in Upper Silesia. Muschelkalk Symposium in Schöntal (Germany), 12-20 August, 1991.
- Prokop, R.J. 1992. New recognized data about the stratigraphical distribution of echinoderms in the Devonian of Bohemia... p.32. 62. Jahrestagung der Deutsches Paläontologischen Gesellschaft. September, 1992, Berlin.
- Hamel, J.-F., G. Desrosiers. 1993. Larval fixation and post-metamorphic migration of the sea cucumber *Cucumaria frondosa*. 28th European Marine Biology Symposium, Hersonissos, Crète, Grèce.
- Bonasoro, F., M.D. Candia Carnevali. Strutture accessorie per la manipolazione dell'alimento nella lanterna di Aristotele di *Paracentrotus lividus*. Atti del 54 Convegno U.Z.I., Perugia 1992. (pp. 295-296).
- Bonasoro, F., M.D. Candia Carnevali. 1993. Peculiarità strutturali del tessuto cordoide (asse parodontale) degli Echinoidei regolari. Atti del 55 Congresso U.Z.I., Torino. p. 196.
- Boudouresque, C.F., A. Caltagirone, J.R. Lefevre, V. Rico, R. Semroud. Macrozoobenthos in the Scandola Nature Reserve (Corsica, North Mediterranean): Pluriannual analysis of the "Reserve effect". Medpan News, 3: 15-20.
- Candia Carnevali, M.D., I.C. Wilkie, G. Melone, F. Bonasoro. 1992. Morphologia funzionale dell'apparato boccale di *Ophioderma longicaudum* (Echinodermi, Ofiuroidei). Atti del 54 Convegno U.Z.I., Perugia, 1992. (pp. 252-253).
- Candia Carnevali, M.D., Bonasoro, F. 1993. Derivazione celomatica dei muscoli e dei legamenti della lanterna di Aristotele degli Echinoidei Regolari. Atti del 55 Congresso U.Z.I., Torino. p.197.
- Maier, M.S., A.J. Roccatagliata, A.M. Seldes. Novel steroidal glycoside sulfates from the starfish *Cosmasterias lurida*. Seventh International Symposium on Marine Natural Products (VII MaNaPro). July 5-10 1992, Capri, Italy.

MEXICO

- Borzzone, C.A. Distribución de la malacofuana en el infralitoral de una playa arenosa expuesta del sur del Brasil. V Congreso Latinoamericano de Ciencias del Mar, Outubro de 1993, La Paz, Mexico.
- Borzzone, C.A., A.G. Soares, J.R.B. de Souza. Relación entre morfodinamismo y zonación de macrofauna en playas de la Ilha do Mel, Paraná, Brasil. V Congreso Latinoamericano de Ciencias del Mar, Outubro de 1993, La Paz, Mexico.
- Buitrón-Sánchez, B., F.A. Solís-Marín, J.B. Miranda. 1994. Un platiastérico (Echinodermata: Asteroidea) del Plioceno de Baja California. Univ. Autón. B. California, Southern Calif. Marine Inst. y Univ. Autón. B. Calif. Sur. X Symposium Marine Biology (in press).
- Roccatagliata, A.J., A.M. Seldes, M.S. Maier. Glicósidos biológicamente activos de la estrella de mar *Cosmasterias lurida*. IX° Simposio Nacional de Química Orgánica. 17-19 November 1993.
- Solís Marín, F.A., Buitrón Sánchez, B.E. La bioversidad en los equinodermos fósiles y recientes de México. Symposium sobre diversidad biológica en México. Sociedad mexicana de Historia Natural. México, D.F., October 21-23, 1992.

SOUTH AMERICA

- Borzzone, C.A., E. Marone, C.R. Soares. Caracterização física, geológica e biológica de Praia do Balneário de Atami-PR. III Simposio de Ecossistemas da Costa Brasileira, Abril 1993, Serra Negra, Brasil.
- Roccatagliata, A.J., M.S. Maier, A.M. Seldes. Glicósidos esteroidales novedosos aislados de la estrella de mar *Cosmasterias lurida*. Jornadas Nacionales de Ciencias del Mar '93. Universidad Nacional de la Patagonia, Centro Nacional Patagónico. Puerto Madryn, 19-25 de setiembre de 1993.

INDIA

- James, D.B. 1993. Sea cucumbers and sea urchins. INDAQUA Business Sessions, Marine Products Development Authority, Madras, India, 20 March.
- James, D.B. 1994. Sea ranching of sea cucumbers. Central Marine Fisheries Research Institute, Kochi, India, 28 April.
- James, D.B. 1993. Urban environment of Tuticorin with special reference to pollution caused by bêche-de-mer industry. Madras Inst. of Development Studies and VOC College, Madras, 16 August.
- James, D.B. 1993. Seed production in sea cucumbers. Indian Aqua Trade Fair, Vijayawada, India, 20 November. (National Seminar).

NEW ZEALAND

- Keogh, J., P.V. Mladenov. 1991. The kina (sea urchin) fishery of the central fisheries region: assessment and management considerations. NZ Marine Sciences Society Annual Conference, 28-30 Aug.
- Mladenov, P.V. 1991. The importance of echinoderms in Fiordland. Proceedings of the Planning Workshop - Fiords Marine Research, 26-27 August, Wellington, New Zealand.
- Murphy, C., P.V. Mladenov. 1992. Autotomy promoting factor (APF) in New Zealand sea stars. NZ Marine Sciences Society Annual Conference.

NEW CALEDONIA

- Mladenov, P.V., C.J. Murphy. 1991. Autotomy promoting factor (APF) in south west Pacific sea stars. Third Pacific-Asia Symposium on Biologically Active Natural Products, Noumea, New Caledonia, August 26-30.

JAPAN

- Kurihara, T. Distribution of starfishes (Asteroidea) in the Tango Sea. 7th Benthos Conference in Japan, Senda, 30-31 August 1993.
- Perez-Ruzafa, A. 1990. Feeding activity in a Dendrochirotid holothurian, *Cucumaria miniata*. 7th Int'l Echinoderm Conf, Japan.
- Thandar, A.S. 1990. Some peculiar morphological features of *Neothyonidium arthroprocessum*, a new phylloporid holothurian from South Africa. 7th Int'l Echinoderm Conf, Atami, Japan, Aug. 1990.
- Thandar, A.S. 1990. Geographic and bathymetric distribution of southern African deep sea holothuroids. 7th Int'l Echinoderm Conference, Atami, Japan, Aug. 1990.
- Ushiyama, A. 1993. ARIS and its receptor in starfish. 1st International Symposium on the Molecular and Cell Biology of Egg and Embryo-coats, Yokohama, Japan, April 6-12, 1993. J. Rep. Dev. 39, Supplement 53-54, 1993.

SOUTH AFRICA

- Thandar, A.S. 1990. Southern African deep sea holothuroids. Oceans'90, 7th Nat. Oceanog. Conf., San Lameer, S. Africa, June 1990.
- Thandar, A.S. 1991. Phylogeny of the southern African holothuriid sea cucumbers. Zool.Soc.S.Afr.Symp., Univ. Stellenbosch, S.Africa

UNITED STATES

- Byrne, M. 1993. Evolution of larval body form and life history diversity in Australian asteroids in the genus *Patiriella*. Larval Ecology Conference, State University of New York at Stony Brook.
- Grabowsky, G. 1993. Morphological space-time transformations: constructing peanut M&M shaped sea urchins from plain M&M shaped ancestors. The Society for the Study of Evolution Meetings, Snowbird, Utah, June 1993.
- Hamel, J.-F., J.H. Himmelman, L. Dufresne. 1992. Relation between reproductive cycle of the sea cucumber *Psolus fabricii* (Düben & Koren) and environmental conditions. North American Friends of Echinoderms, 1992, Conference and workshop, Fort Pierce (Harbor Branch Oceanographic Institution), Florida, U.S.A.
- Leviton, D.R. Problems of scale with in situ fertilization studies. Larval Ecology Conference, August 1993.
- Medeiros-Bergen, D. Growth and mortality of two species of intertidal ophiuroids. Western Society of Naturalists, Santa Barbara, California, 1991.
- Medeiros-Bergen, D. Growth and mortality of two species of intertidal ophiuroids. Southern California Academy of Science, Palo Alto, California, 1992.
- Medeiros-Bergen, D., N. Perna, R.R. Olson, T.D. Kocher. Molecular identification of ophiuroid larvae may reveal transport offshore (poster). Benthic Ecology Meeting, Mobile, Alabama, 1993.
- Medeiros-Bergen, D. Identification of sea cucumber larvae using genetic markers. Benthic Ecology Meeting, Mobile, Alabama, 1993.
- Medeiros-Bergen, D. Is longshore transport important in recruitment variation of sea cucumbers? Larval Ecology Meeting, Port Jefferson, New York, 1993.
- Medeiros-Bergen, D. Molecular identification and seasonal abundance of ophiuroid larvae and post-larvae in the western Gulf of Maine (poster). Benthic Ecology Meeting, Mystic, Ct., 1994.
- Mladenov, P.V., P. Gerring, N. Rayns. 1991. Sustainable development of a bêche-de-mer (sea cucumber) fishery in New Zealand. XVII Pacific Science Congress, 27 May - 2 June, Honolulu.
- Scheltema, R.S., I.P. Williams. On dispersal of teleplanic larvae in the North Atlantic. I. Congruent non-random advection by ocean currents. II. Retention by larvae of their capacity to metamorphose. POPULATION BIOLOGISTS OF NEW ENGLAND, (PBONE), 1993. (similar paper presented at LARVAL ECOLOGY MEETING, Port Jefferson, N.Y., August 1993).
- Wray, G.A. 1993. Punctuated evolution of developmental mechanisms. Society of Developmental Biologists, 1993.

THESES AND DISSERTATIONS

ARGENTINA

Ph.D. Dissertation

Borzzone, C.A. 1991. Ecologia de los moluscos del infralitoral raso de una playa arenosa expuesta del sur del Brasil. UBA, Buenos Aires. 222 pp.

AUSTRALIA

BSc Honours Thesis

Braidwood, F. 1993. Ultrastructure of the hyaline layer of the larvae of two sea urchins: *Heliocidaris tuberculata* and *H. erythrogramma* and evidence for the presence of associated bacteria. University of Sydney.

Siegel, R.K. 1993. A comparison of vitellogenic mechanisms in oligolecithal and macrolecithal eggs, illustrated by the congeneric sea urchins, *Heliocidaris tuberculata* and *H. erythrogramma*. University of Sydney.

Ph.D. Dissertation

Prince, J. 1992. Community organization on intertidal rock platforms at Rottnest Island, Western Australia. The functional role of the sea urchin *Echinometra mathaei* (de Blainville, 1825). University of Western Australia

BELGIUM

Ph.D. Dissertation

Van Den Spiegel, D. 1993. Morphologie fonctionnelle et comparee des organes de defenses (tubes de cuvier) des holothuries (Echinodermata). Universite de Mons

BRAZIL

Master's Thesis

Borzzone, C.A. 1988. A macrofauna bentonica infralitoral da região costeira adjacente à barra de Rio Grande. FURG, Rio Grande, Brasil. 113 pp.

CANADA

Honour's Thesis (BSc)

Hamel, J.-F. 1990. Cycle reproducteur du concombre de mer *Psolus*

fabricii (Düben and Koren). Université Laval (Québec), 54 p.

Master Thesis (MSc)

Hamel, J.-F. 1992. Relation entre le cycle reproducteur du concombre de mer *Psolus fabricii* (Düben and Koren) et les conditions environnementales. Université Laval (Québec), 73p.

Ph.D. Dissertation

Maheu, S. 1993. Étude des mécanismes de prise en charge, de transport et d'excrétion du mercure et du méthylmercure chez l'étoile de mer *Leptasterias polaris*. Université de Québec, Rimouski.

Rouleau, C. 1994. Cinétique d'accumulation et de distribution du méthylmercure, du tributylétain et des ions inorganiques correspondants chez l'étoile de mer, *Asterias rubens* et *Leptasterias polaris*. Université de Québec, Rimouski.

CHILE

Licenate

Pérez Espinosa, E.P. 1991. Patrón de alimentación y aspectos poblacionales de *Heliaster helianthus* en bahia la Herradura. Universidad Católica del Norte.

Magister en Ciencias

Acosta, G. 1990. Aspectos autoecológicos de juveniles de *Heliaster helianthus* (Asteroidea: Forcipulatida) en el intermareal de Las Cruces, Chile central. Universidad de Chile.

CZECH REPUBLIC

Master's Theses

Slámová, R. 1987. Disarticulated parts of the crinoid stems from the base of Zlíchov Formation, Lower Emsian, 'U kapličky' quarry, Praha-Zlíchov., 129 pp., 37 text-figs, 23 pls.

FRANCE

Ph.D. Dissertation

Breton, G. 1992. Les Goniasteridae (Asteroidea, Echinodermata) jurassiques et crétacés de France: taphonomie, systématique, biostratigraphie, paléobiogéographie, évolution. Université de Caen (20.10.1990). Bull. trim. Soc. géol. Normandie et Amis du Muséum du Havre, fasc. hors série, suppl. au tome 78, fascicule 4, Le Havre, ISBN 2-908989-00-X. 590 p., 172 fig.-texte, 13

tablx., 48 pl., bibl., index, résumés angl., all., fr.
(is available (480 FF + postage) at: Société Géologique de
Normandie, Muséum d'Histoire Naturelle, Place du Vieux Marché,
F.76600 Le Havre, FRANCE).

Thesis - DEA

Guettaf, M. 1992. Contribution a la connaissance de la
variabilite de l'indice gonadique de l'oursin comestible
Paracentrotus lividus (Echinodermata: Echinidae) dans la region
Marseillaise. Universite d'Aix-Marseille II, Faculte des
Sciences de Luminy.

Ruitton, S. 1993. Comportement alimentaire et indices
physiologiques de *Paracentrotus lividus* (Echinidae) dans un
peuplement à *Caulerpa taxifolia* (Chlorophyte). Universite
d'Aix-Marseille II, Faculte des Sciences de Luminy.

GERMANY

Thesis

Wörheide, G. Comparative biometrical and ecomorphological studies
on boreal and Mediterranean populations of the *Echinocardium*
cordatum (Pennant, 1777) group (Echinoidea, Spatangoida).

Ph.D. Dissertation

Schoppe, S. 1993. Die Karpse um den felsbohrenden seeigel
Echinometra lucunter (L.): Untersuchung der Lebensraumbe-
dingungen und der biologie der assoziierten arten. 128pp.
Justus-Liebig-University

GREECE

Ph.D. Dissertation

Dounas, C.G. 1986. Study of the macrofaunal assemblages of
Strymonikos Gulf. University of Thessaloniki.

Karakassis, J. 1991. Contribution to the study of the benthic
ecosystems in the continental shelf around Crete. University of
Crete.

Koukouras, A. 1979. Bionomic study of the macrofauna of the medi-
littoral soft substratum in Strymonikos and Thermaikos Gulfs.
University of Thessaloniki.

Panucci, M.A. 1984. The echinoderms in the infralittoral zone of
the western coasts of Greece. University of Athens.

Papazacharias, A.S. 1991. Ecological study of the soft substratum

macrofauna in the infralittoral zone of the Gulf of Kavala.
University of Thessaloniki.

Vamvakas, C.N. 1971. Contribution to the study of soft bottom benthic biocoenoses in soft substrata around the Greek seas (W Saronikos Gulf). University of Thessaloniki.

Zarkanellas, A.J. 1980. Ecological study of the macrozoobenthos in Thermaikos Gulf. University of Thessaloniki.

IRELAND

BA Thesis

Feldman, A.L. Ammonia excretion in the brittlestars *Ophiocomina nigra* and *Ophiothrix fragilis*. Trinity College Dublin.

JAPAN

Okinaga. Structures and functions of the saccharide chains of acrosome reaction-inducing substance in starfish egg jelly.

BA Thesis

Miyazaki, H. Feeding behavior of the coral reef asteroid *Protoreaster nodosus*. University of the Ryukyus.

Master's Thesis

Kurihara, T. 1992. Distribution and life history of starfishes (Asteroidea) off the coast of Kyoto prefecture. Faculty of Agriculture, Kyoto University.

MEXICO

Thesis

Barrios-Matías, S. 1992. Equinoides (Echinodermata: Echinoidea) del Cretácico Superior de Ahuexotitlán Gro. Implicaciones paleogeográficas y paleoecológicas. Univ. Autón. Guerrero, Esc. Ciencias Químico-Biológicas, 45 pp.

López-García, R. 1993. Análisis bioestadístico de las especies del género *Heteraster* D'Orbigny, 1853 del Cretácico Temprano de Chumbítaró, Michoacán. Univ. Michoacana de San Nicolás, Hgo. Esc. Biología, 40 pp.

Solís-Marín, F.A. Equinoides (Echinodermata: Echinoidea) del Cretácico superior de Ahuexotitlán, Guerrero; Implicaciones paleogeográficas y paleoecológicas. 1992. Santiago Barrios Matías. Univ. Nat. Autón. de Guerrero. 39 pp.

NEW ZEALAND

Thesis

Brewin, P.E. (in progress, tentatively titled). Effect of algal diets on gonad composition, growth and reproductive cycle of *Evechinus chloroticus* (Val.) (Echinodermata: Echinoidea).

RUSSIA

Ph.D. Dissertation

Eliseikina, M.G. Morphofunctional states and physiological regeneration of digestive tract lining epithelium in *Cucumaria japonica*.

Evdokimov, V.V. Morphofunctional estimation of gametes and productional possibilities of sea organisms at the period of their reproduction in mono-and polyculture.

SOUTH AFRICA

Master's Thesis

Foster, G.G. 1994. Aspects of the biology and ecology of some intertidal holothurians (Echinodermata) along the eastern Cape coast of South Africa. Rhodes University

Bentley, A. Ecology of the sand dollar *Echinodiscus bisperforatus*. University of Port Elizabeth.

Ph.D. Dissertation

Drummond, A.E. 1993. Studies on the life history biology of three species of regular echinoid on the South African east coast. University of Natal.

SPAIN

Master's Thesis

Perez-Ruzafa, A. 1984. Estudio sistemático, ecológica y biogeográfico de la Clase Holothuroidea (Echinodermata) en las Islas Canarias. University of La Laguna, Canary Islands.

USA

Master's Thesis

D'Andrea, A.F. 1993. Sublethal effects of cadmium on arm regeneration in the burrowing brittlestar *Microphiopholis*

gracillima (Stimpson) (Echinodermata: Ophiuroidea). 119 p.
University of South Carolina.

McHenry, A.C. 1993. Cadmium uptake and internal localization by the burrowing brittlestar *Microphiopholis gracillima* (Stimpson) (Echinodermata: Ophiuroidea). South Carolina.

Medeiros-Bergen, D.E. 1991. Growth, mortality and resource allocations of two coexisting species of intertidal ophiuroids. University of New Hampshire.

Rogers-Bennett, L. 1989. The spatial distribution of juvenile green sea urchins. University of Massachusetts. Boston, Mass.

Sumrall, C.D. 1991. Functional morphology in Late Paleozoic edrioasteroids and its taxonomic implications. University of Texas at Austin.

Wasson, K.M. 1993. Changes in the nucleic acid levels of the pyloric ceaca of *Asterias forbesi* (Desor) (Echinodermata: Asteroidea) and the gut of *Strongylocentrotus droebachiensis* (Müller) (Echinodermata: Echinoidea) in conjunction with the annual reproductive cycle. 126pp. Bloomsburg University, Pa.

Ph.D. Dissertation

Grabowsky, G. 1993. Constructing diversity: Growth and form in elliptical sea urchins (Echinoidea: Echinometridae). Duke University, North Carolina.

Holterhoff, P.F. 1993. The application of filtration theory to the paleoecology of crinoids from the Lansing Group (Late Pennsylvanian, Missourian), midcontinent North America. University of Cincinnati, Ohio.

Medeiros-Bergen, D.E. (in progress). Coastal transport and dispersal of sea cucumber larvae. University of New Hampshire.

HOW I BEGAN TO STUDY ECHINODERMS ... Part 4.

Feldman, Abby L. (University College, Galway). Studying Zoology as an undergrad in Trinity College Dublin, I became fascinated with echinoderms and cnidarians during a course of lectures given by Frank Jeal. When it came time to choose a supervisor for my final year project I grabbed him before anyone else did! He suggested I work with brittlestars. During my course of study I met up with Elizabeth Sides who had worked with *Ophiothrix fragilis* in Jamaica for 15 years. My association with both of these echinoderm people only served to install the feeling in me. The final straw, so to speak, occurred when my father convinced me to learn how to dive. Being terrified of the water this was no easy feat for me, but on my very first open water dive in Dalkey Sound, east coast of Ireland, the first thing I saw was a bed of brittlestars! I became so excited that I forgot to be afraid and since then, I have decided that there is nothing more interesting than an echinoderm. Or an Echinoderm scientist!!

Messing, Charles G. (NOVA University). I became fascinated with the great diversity of marine invertebrates sometime during college (having finally been convinced by parents and teachers that I could not make a living from dinosaurs--if they only knew about Jurassic Park), but had no real understanding of systematic research or on which group to concentrate. At the University of Miami's Institute of Marine Science (now RSMAS) in 1970 for graduate school, I gravitated to the invertebrate museum and came under Frederick M. Bayer's tutelage. I recall being made aware that the large R/V Gerda and Pillsbury crinoid collection needed working up. Bayer gave me several volumes of A.H. Clark's crinoid monograph and also used crinoid specimens in teaching me how to use a camera lucida. However, Gilbert Voss, then department chair, recommended that I work on the development and taxonomy of a large neotanaid crustacean from the Puerto Rico Trench for my master's thesis. I pursued this subject for about a year, finally discovering that someone had recently monographed the entire family; my own work had to await its publication, which kept getting put off. Seeking an alternative, I expanded a project on crinoid taxonomy for Bayer and Voss's Systematics of Invertebrates course into a thesis on comatulid crinoids of the Straits of Florida.

Zavodnik, Dušan (Center for Marine Research, Rudjer Bošković Institute, Rovinj, Croatia). Although born in a "continent" town, from childhood I felt an affinity to the sea and marine

creatures. But in the post-second-world-war times of poverty, I have had few opportunities to visit the Adriatic Sea. Luckily, due to kind gifts from some of my 'sea acquaintances', my collection of land flora exiccata, minerals, and land and fresh water mollusc shells became enriched by marine animals. At the age of fifteen, I held an open exhibition of my collections for the city community: about 150 specimens of marine molluscs and also, some corals, dried sea stars and sea urchins. By the end of my college studentship, because I lacked the money to cover train expenses, I undertook a cycle journey about 600 kilometers to visit and practice at the Institute of Oceanography and Fisheries at Split. There the assistant Mr. J. Hoenigman introduced me to zooplankton research which was also my occupation during the initial years of my University education. My scientific interest turned mostly to pelagic Copepod Crustaceans, and as well I have much enjoyed the skin and "hand-pump" diving. Thus it happened that I collected a beautiful female parasitic copepod Cancerilla tubulata with ovisacs attached on the oral side of a disk of a tiny brittle-star concealed in an algal thalus. I succeeded in identifying the creature as Amphipholis squamata. This event turned my major interest to echinoderms, to their taxonomy, ecology and distribution in the Adriatic Sea. In 1960, after my military service was over, I was engaged as an assistant at the Marine Biological Station at Rovinj, which continues to be my employer institution. But alas, in our small state, and in a small institute, it very soon became evident that an exclusive engagement in echinoderm studies is a mere illusion. The funds were available for other tasks and therefore I have had to do research in physiology of sardines, in morphology and ecology of small pelagic fish, in zooplankton, benthic communities studies, shellfish culture, pollution studies and even hydrography of the north Adriatic Sea. In the bulk of the "indispensable" i.e. first ranked tasks, echinoderms could be treated only as a hobby task - and regrettably, they remained to me a hobby until now. But it is true that continuous studies of shallow water benthic communities, especially by SCUBA diving always were excellent opportunities to collect immense quantities of by-the-way data on echinoderm diversity and their behavior and distribution patterns.



Dom CARLOS I
Roi de Portugal



ALBERT I^{er}
Prince de Monaco

SOUVERAINS OCEANOGRAPHES

PRÉFACE DE S.A.S. LE PRINCE RAINIER III DE MONACO



Documents réunis et commentés par
JACQUELINE CARPINE-LANCRE et LUIZ VIEIRA CALDAS SALDANHA

Fondation Calouste Gulbenkian
Lisbonne
1992

Souverains océanographes

documents edited by

Jacqueline CARPINE-LANCRE et Luiz Vieira Caldas SALDANHA

A 179 page oblong volume (size 24 x 30 cm). Numerous illustrations: portraits, reproductions of letters, photographs, sketches and watercolours by D.D. Carlos. Short biographies of the persons mentioned; name index, subject index.

Prince Albert I of Monaco (1848-1922) and the King of Portugal D. Carlos I (1863-1908) were enthusiastic oceanographic pioneers. Thorough searches were undertaken in the Archives of Monaco (Prince's Palace, Oceanographic Museum), of Portugal (Arquivo Nacional da Torre do Tombo, Museum Oceanográfico D. Carlos I / Aquário Vasco da Gama) and in Paris (Archives de la Maison de France, *branche d'Orléans*). They resulted in finding numerous documents written by both Sovereigns and their main assistants: Doctor Jules Richard, Albert Girard, Colonel Chaves. Ninety letters, most of them hitherto unpublished, were selected, transcribed and annotated in detail.

The correspondence between D. Carlos and Prince Albert, exchanged in French between 1894 and 1907, is mainly dedicated to scientific subjects: oceanographic cruises on board the yachts *Princess-Alice* and *Amelia*; scientific projects, ideas, and techniques; improvements in the use of gears and methods; study of the specimens and data; unremitting efforts to set up and promote meteorological observatories in the Azores. Other topics (politics, diplomacy, music) are sometimes mentioned and add a human touch to the book.

True to its tradition of patron of arts and sciences, the Gulbenkian Foundation produced a handsome volume: careful typography and print, original make-up, lavish illustrations. The attractiveness of the presentation of this sophisticated and erudite book makes it into a document of an exceptional quality.

ORDER FORM

to be returned to the following address

**Bibliothèque
Musée océanographique
Avenue Saint-Martin
MC 98000 MONACO**

The price of the book is 250 (two hundred and fifty) French Francs, postage and packing included.

The payment must be made either by banker's cheque or postal cheque written out in French Francs to the order of the Institut océanographique (at no charge for the Museum).

Address where the book must be sent

.....



INSTITUT OcéANOGRAPHIQUE

FONDATION ALBERT I^{er} PRINCE DE MONACO

RECONNU D'UTILITÉ PUBLIQUE

911536.07
Tél. 469037 MC
Télex 91505297

Le Musée océanographique de Monaco offre aux participants à la 8th International Echinoderm Conference des conditions spéciales pour acquérir ses publications consacrées aux échinodermes.

Pour en bénéficier, il convient :

- d'utiliser le bon de commande spécial ;
- de le retourner avant le 31 décembre 1993, dernier délai, à l'adresse suivante :

BIBLIOTHEQUE
Musée océanographique
Avenue Saint-Martin
MC 98000 MONACO

- de régler le montant de la commande
soit par virement bancaire :
Institut océanographique
RIB 30002 3214 602465 52
Crédit Lyonnais, Agence de Monte-Carlo
Avenue Princesse-Alice, MC 98000 MONACO ;

soit (uniquement pour les personnes résidant en France)
par chèque à l'ordre de l'Institut océanographique ; dans ce cas, le chèque doit être joint à la commande.

* * * * *

Nous attirons votre attention sur les fascicules de la série des Résultats des campagnes scientifiques accomplies sur son yacht par Albert I^{er}, Prince Souverain de Monaco. Les volumes qui vous sont proposés correspondent au tirage initial, limité à 500 exemplaires. L'impression a été faite sur papier vergé fabriqué spécialement avec les filigranes du monogramme du Prince et du blason princier ; les planches en couleurs ont été exécutées en lithographie par les meilleurs spécialistes de l'époque.

Avec tous nos souhaits pour une conférence fructueuse et agréable.

BIBLIOTHEQUE • Musée océanographique • Avenue Saint-Martin • MC 98000 MONACO

The Oceanographic Museum of Monaco offers special conditions to purchase publications devoted to the Echinodermata to persons taking part in the 8th International Echinoderm Conference.

To take advantage of this offer, you must use the special order form and send it back to us before December 31, 1993, at the latest, to the following address:

BIBLIOTHEQUE
Musée océanographique
Avenue Saint-Martin
MC 98000 MONACO

Payment must be made only by bank transfer in French Francs with bank charges to be paid by the purchaser:

Institut océanographique
RIB 30002 3214 602465 52
Crédit Lyonnais, Agence de Monte-Carlo
Avenue Princesse-Alice, MC 98000 MONACO

* * * * *

May we draw your attention to the volumes of the series Résultats des campagnes scientifiques accomplies sur son yacht par Albert I^{er}, Prince Souverain de Monaco. The ones offered to you correspond to the initial printing of 500 copies only. Printing was done on laid paper specially made with the watermark of the monogram of the Prince and the princely coat of arms. Colour plates were lithographed by the best printers of that time.

With our best wishes for a successful and pleasant meeting.

PUBLICATIONS DU MUSÉE Océanographique de Monaco

Echinodermes

RÉSULTATS des CAMPAGNES SCIENTIFIQUES

- N° 6 : Contribution à l'étude des Holothuries de l'Atlantique Nord / E. von MARENZELLER. - 22 p., 2 pl. (1893).
- N° 11 : Contribution à l'étude des Stellérides de l'Atlantique Nord (golfe de Gascogne, Açores, Terre-Neuve) / E. PERRIER. - 59 p., 4 pl. (1896).
- N° 12 : Echinides et Ophiures provenant des campagnes du yacht KOEHLER. - 78 p., 10 pl. (1898).
- N° 21 : Holothuries provenant des campagnes de la Princesse-Alice (1892-1897) / E. MÉROUARD. - 61 p., 8 pl. (1902).
- N° 34 : Echinodermes provenant des campagnes du yacht Princesse-Alice (Astérides, Ophiures, Echinides et Crinoïdes) / R. KOEHLER. - 317 p., 32 pl. (1909).
- N° 66 : Holothuries provenant des campagnes des yachts Princesse-Alice et Hirondeille II (1898-1915) / E. MÉROUARD. - 163 p., 10 pl. (1923).

BULLETIN de l'INSTITUT Océanographique

- N° 60 : Sur Pelagothuria Bouvieri (Holothurie pélagique nouvelle) recueillie pendant la campagne du yacht "Princesse-Alice" en 1905 / E. MÉROUARD. - 6 p., 2 fig. (1906).
- N° 64 : Description d'une nouvelle larve d'Astérie appartenant très vraisemblablement à une forme abyssale (Steliosphaera mirabilis) / R. KOEHLER & C. VANEY. - 10 p., 5 fig. (1906).
- N° 99 : Note préliminaire sur quelques Astérides et Ophiures provenant des campagnes de la "Princesse-Alice" / R. KOEHLER. - 47 p. (1907).
- N° 118 : Description d'un nouveau genre de Prosobranches parasite sur certains Echinides (Pelseneria nov. gen.) / R. KOEHLER & C. VANEY. - 16 p., 10 fig. (1908).
- N° 145 : Triconus, nouveau genre de la famille des Psychropotinae / E. MÉROUARD. - 5 p. (1909).
- N° 177 : Sur les Molpadides de Norvège / E. MÉROUARD. - 10 p., 5 fig. (1910).

Echinodermes : Bulletin de l'Institut océanographique (suite)

2

- N° 239 : Holothuries nouvelles des campagnes du yacht Princesse-Alice (note préliminaire) / E. MÉROUARD. - 9 p., 7 fig. (1912).
- N° 240 : Sur l'appareil excréteur chez la larve de Strongylocentrotus lividus / J. RUNNSTROM. - 14 p., 9 fig. (1912).
- N° 245 : L'effet de l'inanition sur la larve de l'Oursin / J. RUNNSTROM. - 20 p., 7 fig. (1912).
- N° 247 : Quelques observations sur la variation et la corrélation chez la larve de l'Oursin / J. RUNNSTROM. - 16 p. (1912).
- N° 285 : The circulation of the abyssal waters of the oceans, as indicated by the geographical and bathymetrical distribution of the recent crinoids / A.H. CLARK. - 27 p. (1914).
- N° 294 : Une étude philosophique de la relation entre les Crinoïdes actuels et la température de leur habitat / A.H. CLARK. - 11 p. (1914).
- N° 301 : L'hémiplexie et la phylogénie des Echinodermes / E. MÉROUARD. - 13 p., 2 fig. (1915).
- N° 306 : Le tannin et le sucre dans la parthénogénèse des Oursins / Y. DELAGE & H. GOLDSMITH. - 11 p. (1915).
- N° 311 : Description d'une nouvelle espèce d'Astrophisura, l'Astrophisura Cavellae / R. KOEHLER. - 15 p., 6 fig. (1915).
- N° 325 : Contributions à l'étude de la régénération chez les Echinides (note préliminaire) / J. NUSBAUM-KILANOWICZ & H. OKNER. - 8 p., 5 fig. (1917).
- N° 370 : Un Strongylocentrotus lividus anormal / J. COTTE. - 10 p., 3 fig. (1920).
- N° 396 : Echinodermes (Astérides, Ophiures, Echinides et Crinoïdes) des dernières campagnes de la Princesse-Alice et de l'Hirondeille II / R. KOEHLER. - 8 p., 1 fig. (1921).
- N° 419 : Anomales et irrégularités du test des Echinides / R. KOEHLER. - 159 p., 22 fig. (1922).
- N° 437 : Propriétés physico-chimiques de quelques constituants de l'œuf d'Oursin / F. VLES, G. ACHARD & D. PRIKELMAIER. - 8 p., 3 fig. (1923).
- N° 444 : The genus Sclerasterias Perrier / W.K. FISHER. - 8 p., 4 fig. (1924).
- N° 446 : Documents pour servir à l'étude de la variation chez les Echinides / R. KOEHLER & A. BONNET. - 24 p., 6 fig. (1924).
- N° 450 : Recherches potentiométriques sur le pH intérieur de l'œuf d'Oursin / F. VLES, P. REISS & E. VELLINGER. - 14 p., 2 fig. (1924).

PUBLICATIONS du MUSÉE Océanographique de MONACO

Échinodermes

ULTIMATS des CAMPAGNES SCIENTIFIQUES

- 6 : Contribution à l'étude des Holothuries de l'Atlantique Nord / E. von MARENZELLER. - 22 p., 2 pl. (1893).
- 11 : Contribution à l'étude des Stellérides de l'Atlantique Nord (golfe de Gascogne, Açores, Terre-Neuve) / E. PERRIER. - 59 p., 4 pl. (1896).
- 12 : Échinides et Ophiures provenant des campagnes du yacht KOEHLER. - 78 p., 10 pl. (1898).
- 21 : Holothuries provenant des campagnes de la Princesse-Alice (1892-1897) / E. HÉROUARD. - 61 p., 8 pl. (1902).
- 34 : Échinodermes provenant des campagnes du yacht Princesse-Alice (Astéries, Ophiures, Échinides et Crinoïdes) / R. KOEHLER. - 317 p., 32 pl. (1909).
- 66 : Holothuries provenant des campagnes des yachts Princesse-Alice et Hérondelle II (1898-1915) / E. HÉROUARD. - 163 p., 10 pl. (1923).
- LETIN de l'INSTITUT Océanographique
- 60 : Sur *Pelagothuria Bouvieri* (Holothurie pélagique nouvelle) recueillie pendant la campagne du yacht "Princesse-Alice" en 1905 / E. HÉROUARD. - 6 p., 2 fig. (1906).
- 64 : Description d'une nouvelle larve d'Astérie appartenant très vraisemblablement à une forme abyssale (*Stelliosphaera mirabilis*) / R. KOEHLER & C. VANEY. - 10 p., 5 fig. (1906).
- 99 : Note préliminaire sur quelques Astéries et Ophiures provenant des campagnes de la "Princesse-Alice" / R. KOEHLER. - 47 p. (1907).
- 118 : Description d'un nouveau genre de Prosobranches parasite sur certains Échinides (*Peliseueria* nov. gen.) / R. KOEHLER & C. VANEY. - 16 p., 10 fig. (1908).
- 145 : *Triconus*, nouveau genre de la famille des Psychropotlineae / E. HÉROUARD. - 5 p. (1909).
- 177 : Sur les *Molpadides* de Norvège / E. HÉROUARD. - 10 p., 5 fig. (1910).

Échinodermes : Bulletin de l'Institut océanographique (suite)

2

- N° 239 : Holothuries nouvelles des campagnes du yacht Princesse-Alice (note préliminaire) / E. HÉROUARD. - 9 p., 7 fig. (1912).
- N° 240 : Sur l'appareil excréteur chez la larve de *Strongylocentrotus lividus* / J. RUNNSTROM. - 14 p., 9 fig. (1912).
- N° 245 : L'effet de l'innatation sur la larve de l'Oursin / J. RUNNSTROM. - 20 p., 7 fig. (1912).
- N° 247 : Quelques observations sur la variation et la corrélation chez la larve de l'Oursin / J. RUNNSTROM. - 16 p. (1912).
- N° 285 : The circulation of the abyssal waters of the oceans, as indicated by the geographical and bathymetrical distribution of the recent crinoids / A.H. CLARK. - 27 p. (1914).
- N° 294 : Une étude philosophique de la relation entre les Crinoïdes actuels et la température de leur habitat / A.H. CLARK. - 11 p. (1914).
- N° 301 : L'hémiplexie et la phylogénie des Échinodermes / E. HÉROUARD. - 13 p., 2 fig. (1915).
- N° 306 : Le tannin et le sucre dans la parthénogénèse des Oursins / Y. DELAGE & M. GOLDSMITH. - 11 p. (1915).
- N° 311 : Description d'une nouvelle espèce d'*Astrophilura*, *Astrophilura Cavellae* / R. KOEHLER. - 15 p., 6 fig. (1915).
- N° 325 : Contributions à l'étude de la régénération chez les Échinides (note préliminaire) / J. NUSBAUM-HILAROWICZ & M. OXNER. - 8 p., 5 fig. (1917).
- N° 370 : Un *Strongylocentrotus lividus* anormal / J. COTTE. - 10 p., 3 fig. (1920).
- N° 396 : Échinodermes (Astéries, Ophiures, échinides et Crinoïdes) des dernières campagnes de la Princesse-Alice et de l'Hérondelle II / R. KOEHLER. - 8 p., 1 fig. (1921).
- N° 419 : Anomalies et irrégularités du test des Échinides / R. KOEHLER. - 159 p., 22 fig. (1922).
- N° 437 : Propriétés physico-chimiques de quelques constituants de l'œuf d'Oursin / F. VLES, G. ACHARD & D. PRIKELMAIER. - 8 p., 3 fig. (1923).
- N° 444 : The genus *Sclerasterias* Perrier / W.K. FISHER. - 8 p., 4 fig. (1924).
- N° 446 : Documents pour servir à l'étude de la variation chez les échinides / R. KOEHLER & A. BONNET. - 24 p., 6 fig. (1924).
- N° 450 : Recherches potentiométriques sur le pH intérieur de l'œuf d'Oursin / F. VLES, P. REISS & E. VELLINGER. - 14 p., 2 fig. (1924).

- 58 : Action de la température sur l'oeuf d'Oursin (*Paracentrotus lividus* Lk.). II. Variations de la perméabilité aux sels chez l'oeuf vierge / B. EPHRUSSEI. - 16 p., 4 fig. (1925).
- 62 : Documents pour servir à l'étude de la variation chez les échinides / A. BONNET. - 28 p., 5 fig. (1925).
- 64 : Sur la stéréométrie des corpuscules calciques et leurs rapports avec l'état mésomorphe de la matière / E. HÉROUARD. - 14 p., 8 fig. (1925).
- 68 : Description d'un *Paracentrotus lividus* hexamère / R. KOEHLER & A. BONNET. - 10 p., 6 fig. (1925).
- 72 : Description d'un *Psammechinus miliaris* anormal et fortement déformé, provenant de Luc-sur-mer / R. KOEHLER & A. BONNET. - 10 p., 9 fig. (1926).
- 78 : Documents pour servir à l'étude de la variation chez les échinides. V. Variations du test chez le *Spatangus purpureus* / A. BONNET. - 27 p., 12 fig. (1926).
- 86 : Recherches potentiométriques sur le pH intérieur et sur le potentiel d'oxydation-réduction de l'oeuf d'Oursin / E. VELLINGER. - 12 p., 4 fig. (1927).
- 13 : Recherches sur le pigment de l'oeuf d'*Arbacia* envisagé comme indicateur de pH intracellulaire / F. VLES & E. VELLINGER. - 16 p., 6 fig. (1928).
- 18 : Recherches sur le spectre ultra-violet de l'oeuf d'Oursin (*Paracentrotus lividus* Lk.) et de ses constituants (1^{er} mémoire) / F. VLES & M. GEX. - 32 p., 8 fig. (1928).
- 26 : Etude du vert de bromocrésol comme indicateur de pH intracellulaire / P. REISS. - 14 p., 4 fig. (1928).
- 36 : Action à distance du "Bacterium tumefaciens" sur le développement de l'oeuf d'Oursin / J. MAGROU, M. MAGROU & F. CHOUCROUN. - 4 p., 2 fig. (1929).
- 52 : Description de deux *Dorocidaris papillata* anormaux provenant de Monaco / R. KOEHLER. - 10 p., 8 fig. (1930).
- 59 : Notes échinologiques. VI. Nouvelles observations sur des anomalies du test de *Psammechinus miliaris* Klein / J. MERCIER. - 8 p., 5 fig. (1930).
- 70 : Notes échinologiques. IX. Etude des variations chez *Dorocidaris papillata* Leske et chez *Dorocidaris affinis* Philippi / J. MERCIER. - 20 p., 15 fig. (1931).
- 36 : Documents pour servir à l'étude du rôle des facteurs électriques dans l'évolution des embryons d'Oursin / F. VLES. - 28 p., 8 fig. (1931).
- 39 : Notes sur la lyse électrique de l'oeuf d'Oursin / F. VLES. - 8 p., 5 fig. (1931).
- 32 : Recherches sur les Trématodes parasites des Oursins en Méditerranée / J. TIMON-DAVID. - 16 p., 6 fig. (1934).

- N° 658 : Sur la structure des spectres ultraviolets de l'oeuf d'Oursin (deuxième mémoire) / F. VLES & M. GEX. - 23 p., 8 fig. (1934).
- N° 678 : Action de la thyroxine et de quelques substances chimiquement voisines sur le développement des larves d'Oursin / M.-R. ZERLING. - 11 p., 1 fig. (1934).
- N° 713 : La cristallisation, facteur de segmentation chez les oeufs d'Oursin / G. ATHANASSOPOULOS. - 2 p., 2 fig. (1937).
- N° 756 : Sur quelques espèces nouvelles d'infusoires parasites de Comatules / Z. RAABE. - 11 p., 4 fig. (1938).
- N° 925 : Le comportement de l'oeuf indivis de *Paracentrotus lividus* Lk. en condition hypotonique / C. METTERAL. - 30 p., 14 fig. (1948).
- N° 946 : Révision du manipulateur Synaptites sclérites d'Holothurides fossiles / M. DEFLANDRE-RICAUD. - 11 p., 26 fig. (1949).
- N° 948 : Observations préliminaires sur l'autotomie chez *Coscianasterias tenuispina* Lamarck / A. TARTARIN. - 4 p. (1949).
- N° 956 : La distribution bathymétrique des échinodermes et particulièrement des espèces méditerranéennes / E. TORTONESE. - 16 p. (1949).
- N° 976 : Catalogue des types d'échinodermes du Musée océanographique de Monaco / G. BELLOC. - 43 p. (1950).
- N° 1012 : Contribution à la systématique des sclérites d'Holothurides fossiles / M. DEFLANDRE-RICAUD. - 12 p. (1952).
- N° 1142 : Contribution à la connaissance des échinopliutés de *Paracentrotus lividus* Lmk., et *Psammechinus microtuberculatus* Blainv. / L. PRESSOIR. - 22 p., 16 fig. (1959).
- N° 1243 : Proliférations hémimérides *Eigenschaften von Anticoagulantien am befruchteten Ei von Paracentrotus lividus* und an anderen Versuchsmoellen / G. WILHELM. - 20 p. (1962).
- N° 1291 : Sur les *Echinocardium* d'Europe. Description d'une espèce nouvelle de grande taille, répérée dans trois localités entre Marseille et Gênes : *Echinocardium renauxi* péquignat / E. PÉQUIGNAT. - 22 p., 5 fig., 2 pl. (1962).
- N° 1305 : Concentrations en radionuclides émetteurs gamma présentes par des Holothurides prélevées dans la zone côtière LALOU. - 16 p. (1964).
- N° 1394 : Les échinopliutés de la Méditerranée / L. FENAUUX. - 28 p., 11 fig. (1969).

**Publications de l'Institut océanographique
Fondation Albert I^{er} de Monaco**

**Catalogue thématique
Echinodermes**

L'Institut océanographique édite trois revues scientifiques :

- *Les Annales de l'Institut océanographique* sont éditées depuis 1911. Publiant à l'origine des thèses concernant divers aspects de l'océanographie, elles sont actuellement consacrées à des travaux de recherche originaux, essentiellement en biologie, soumis au préalable à l'avis de deux lecteurs français ou étrangers spécialistes du domaine considéré, en un volume annuel d'environ 200 pages et constitué de deux fascicules.

Les Annales comportent également une rubrique intitulée «Actualités océanographiques» consacrée à des notes de lecture, des analyses d'ouvrages récents et des résumés de thèses se rapportant à tous les domaines de l'étude du milieu marin.

Des fascicules spéciaux rapportent les actes de colloques internationaux, ou les résultats de campagnes océanographiques.

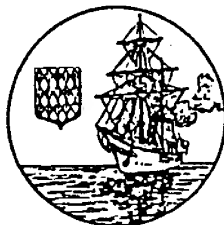
La revue est également imprimée et diffusée en France et à l'étranger par Gauthier-Villars en deux fascicules annuels d'environ 200 pages.

- Depuis 1975, *Océanis*, série de documents océanographiques, est une revue destinée à un public plus large : étudiants, chercheurs. Avec six fascicules par an, elle publie les séminaires de l'Institut océanographique organisés dans le cadre de l'enseignement de 3^e cycle en océanographie, ainsi que des cours (Géographie de l'Océan, Physico-chimie de l'eau de mer...). Certains fascicules sont consacrés à des colloques : Journées internationales du Groupement pour l'avancement de la biochimie marine, colloques du ministère de l'Environnement...

- *Marine Microbial Food Webs* est une nouvelle revue s'intéressant à un domaine de recherche à la fois étroit et en pleine expansion : l'étude du rôle des micro-organismes aquatiques dans la production biologique. Elle est issue d'un colloque de l'OTAN, réunissant les spécialistes mondiaux du domaine, tenu à la Station marine de Villefranche-sur-Mer en 1981. Par la suite, l'édition de deux congrès internationaux, au CREMA-L'Houmeau et à Plymouth, ont contribué à son lancement.

La publication des articles de recherche originaux, en anglais (avec des résumés en français et en anglais) est soumise à l'avis d'un comité éditorial international.

La revue est également imprimée et diffusée en France et à l'étranger par Gauthier-Villars et est éditée depuis 1985 en deux fascicules annuels d'environ 150 pages.



Ce catalogue est extrait du catalogue général des publications de l'Institut océanographique. Les prix qui y figurent sont indiqués franco de port et d'emballage. Le catalogue général est disponible sur demande au service des publications

Annales de l'Institut océanographique

Ancienne série

Tome 2 - 1911

- AA25 Fascicule 5 - Mission Gruvel sur la côte occidentale d'Afrique (1909-1910). Échinodermes, par R. Kœhler (27 p., 3 planches) - Holothuries, par C. Vaney (2 p.) 120 F

Tome 3 - 1912

- AA33 Fascicule 3 - Quinze mois aux îles Kerguelen, par M. Rallier du Baty (25 p.). Échinodermes, par R. Kœhler (6 p., 1 planche). Annélides polychètes, par Ch. Gravier (6 p.) - Arthropodes marins, par E.-L. Bouvier (2 p., 1 planche) - Mollusques marins, par Ed. Lamy (6 p.) - Mollusques terrestres, par L. Germain (2 p.) 150 F

Tome 6 - 1914

- AA65 Fascicule 5 - Études sur la morphologie et la physiologie cellulaires du développement de l'Oursin, (travail fait au Musée océanographique de Monaco), par J. Runnström (185 p.) 250 F

Tome 7 - 1917

- AA78 Fascicule 8 - Échinodermes (Astéries, Ophiures et Échinides) recueillis par M. Rallier du Baty, aux îles de Kerguelen, en 1913-1914 (87 p., 10 planches) 200 F

Nouvelle série

Volume 1 - 1924

- A015 Fascicule 5 - Anomalies, irrégularités et déformations du test chez les Échinides, par R. Kœhler (322 p. + atlas : 32 p. et 32 planches). 300 F

Volume 2 - 1925

- A022 Fascicule 2 - Recherches sur l'appareil digestif et absorbant de quelques Échinides réguliers, par A. Bonnet (22 p., 3 planches). 80 F

Volume 3 - 1927

- A035 Fascicule 5 - Recherches sur la constitution des plaques, la disposition des pores et l'obliquité des canaux ambulacraires chez les Échinides réguliers, par A. Bonnet (35 p.) 50 F

Volume 30 - 1955

- A301 Résultats scientifiques des campagnes de la «Calypso». - Fascicule 1.
I.- Campagne 1951-1952 en mer Rouge.
- Avant-Propos, par le Capitaine de Corvette J.-Y. Cousteau : p. 2-6.
1.- Les récifs coralliens du banc Farsan Nord (mer Rouge), par W. D. Nesteroff : p. 7-54, 21 planches en commun avec l'article suivant.
2.- Géomorphologie de l'extrémité septentrionale du banc Farsan (mer Rouge), par A. Guilcher : p. 55-100.
3.- Annélides Polychètes de la Croisière de la «Calypso» en mer Rouge en 1952, par P. Fauvel : 101-120.
4. Sur quelques Alcyoniidae de la mer Rouge, par A. Tixier-Durivault : p. 121-128.
5.- Les Holothuries de la mer Rouge, par G. Cherbonnier : p. 129-184, 28 planches.

6.- Céphalopodes, par W. Adam : p. 184-194, 1 planche.

7.- Poissons capturés par la mission de la «Calypso» en mer Rouge, par R. Roux-Estève et P. Fourmanoir : p. 195-203. 150 F

Volume 34 - 1958

A341 Résultats scientifiques des Campagnes de la «Calypso».- Fascicule 3.

V.- Campagne 1951-1952 en mer Rouge (suite).

11.- Spongiaires de mer Rouge. Recueillis par la Calypso (1951-1952), par Cl. Lévi : p. 3-46.

VI.- Campagne 1954 dans l'océan Indien.

1.- Les poissons de l'île Aldabra. Campagne océanographique de la «Calypso» (mai-juin 1954), par J. Arnoult, M.-L. Bauchot-Boutin et R. Roux-Estève : p. 47-90.

VII.- Études sur le seuil Siculo-Tunisien (suite).

3.- Sédimentologie sous-marine du détroit Siculo-Tunisien. Campagne de la Calypso (août-septembre 1954), par J. J. Blanc : p. 91-126.

4.- Mollusques testacés, par P. Mars : p. 127-144.

5.- Échinodermes, par M. Gauthier-Michaz : p. 145-156.

VIII.- Campagne 1955 en Méditerranée Nord-Orientale.

1.- Recherches géologiques et sédimentologiques. Campagne de la Calypso (septembre-octobre 1955), par J. J. Blanc : p. 157-212.

2.- Recherches sur les peuplements benthiques, par J.-M. Pérès : p. 213-292.

IX.- Mission de la Calypso (1956) pour l'étude optique des eaux côtières de la Corse

1.- Avant-propos, par Y. Le Grand : 293-296.

2.- Pénétration du rayonnement ultraviolet dans la mer, par J. Lenoble : p. 297-308.

3.- Contribution à l'étude des propriétés optiques de l'eau de mer en Bretagne et en Corse, et à la théorie de la polarisation sous-marine, par A. Ivanoff : p. 309-336. 200 F

Volume 37

A371 Résultats scientifiques des Campagnes de la «Calypso» - Fascicule 4.

X.- Campagne 1956 dans le golfe de Guinée et aux îles Principe, São Tomé et Annobon.

1.- Introduction, par J. Forest : p. 3.

2.- Océanographie physique, par G.R. Berri : p. 37-74.

3.- Aperçu sur les peuplements littoraux, par C. Carpine : p. 75-90.

4.- Foraminifères, par M. Mangin : p. 91-114.

5.- Spongiaires, par Cl. Lévi : p. 115-142.

6.- Annélides polychètes, par P. Fauvel et F. Rullier : p. 143-206.

7.- Sipunculoidea and Echiuroidea, by E. Wesenberg-Lund : p. 207-218.

8.- Chaetognathes, par M.L. Furnestin : p. 219-234.

9.- Pycnogonides, par L. Fage : p. 235-240.

10.- Mollusques pélagiques, par A. Franc : p. 241-244.

XI.- Campagne 1956 sur les côtes de Provence.

1.- Recherches sédimentologique dans les canyons de la Provence occidentale, par J.J. Blanc : 245-272.

XII.- Campagne 1957, dans le golfe de Gènes.

1.- Recherches sur les vases du golfe de Gènes, par J.J. Blanc : 273-288

2.- Échinodermes, par E. Torionese : 289-294.

XIII.- Campagne 1958 en mer d'Alboran et dans la baie Ibéro-Marocaine.

1.- Ascidies, par J.M. Pérès : 295-314.

2.- Annélides polychètes, par G. Bellan : 315-342. 200 F

Volume 54

A541 Fascicule 1 - Evidence of metal pollution in Cetacea of the Western Mediterranean, by D. Viale : p. 5-16.

Dimensions et taux d'ingestion des particules consommées par un Tininnide : *Favella ehrenbergii* (Clap. et Lachm.) Jörg, Cilié pélagique marin, par F. Rassoulzadegan : p. 17-24.

Biologie de *Nyctiphanes couchii* (Crustacea, Euphausiacea) dans le secteur Nord du golfe de Gascogne, par Ph. Gros et J.Cl. Cochard : p. 25-46.

Astérides et Ophiurides littorales de la région d'Amboine (Indonésie), par A. Guille et M. Jangoux : p. 47-73.

Un système d'ouverture-fermeture pour filets à plancton trainés horizontalement ou obliquement et disposés en série, par A. Bourdillon, C. Castelbon et C. Macquart-Moulin : p. 75-84. 40 F

- A542 Fascicule 2 - Nouvelle méthode pour un étalonnage rapide des solutions de ^{14}C destinées aux mesures de la production primaire, par J. Brouardel, E. Rinck et M. Joseph : p. 89-94.
Interface entre deux écosystèmes : exemple dans le domaine pélagique, par S. Frontier : p. 95-106.
Répartition des populations de Foraminifères benthiques dans le golfe Normand-breton et la baie de Seine, par M. Rosset-Moulinier : p. 107-126.
Comportement alimentaire et structures digestives d'*Ophioderma longicauda* (Retzius) (Echinodermata, Ophiuroidea), par M. Deschuyteneer et M. Jangoux : p. 127-138.
Polyclinidae (Ascidacea) du Sud-Ouest de l'océan Indien, par F. Monniot et F. Gaill : p. 139-162.
Quelques Didemnidae et Polycitoridae (Ascidacea) de Kerguelen, par F. Monniot : p. 163-170.
Ascidies phlébobranches et stolidobranches du Sud de l'Océan Indien, par Cl. Monniot : p. 171-224. 50 F

Volume 55

- A551 Fascicule 1 - Geomorphic provinces and the evolution of the north western Iberian continental margin, by J.R. Vanney, J.L. Auxietre and J.P. Dunand : p. 5-20.
Sea-urchin larvae as a tool for assessment of the quality of sea waters, by P. Bougis, M.C. Corre and M. Etienne : p. 21-26.
Sur le genre *Sulculeolaria* par Blainville, 1834. Siphonophora, Calycophorae, Diphyidae, par C. Carré : p. 27-48.
Biologie de *Processa noveli holthuisi*, Aladhub et Williamson (Crustacea Décapoda) dans le secteur nord du Golfe de Gascogne, par P. Gros : p. 49-70.
Contribution à l'étude de la cryptofaune des paliers coralliens de la région de Tuléar (Madagascar), par M. Peyrot-Clausade : p. 71-94.
Ascidians of the Venice Lagoon. I. Annotated inventory of species, by R. Brunetti : p. 95-109. 50 F

Volume 58

- A582 Fascicule 2 - Écologie des Échinoïdes réguliers dans les récifs coralliens de la région de Tuléar (S.W. de Madagascar) : adaptation de la microstructure des piquants, par M.B. Régis et B.A. Thomassin : p. 117-158.
Connaissance de la mangrove de Guadeloupe : constitution chimique des eaux d'imprégnation de la mangrove du grand-Cul-de-Sac Marin. J. Martinet, P. Bourgeois et H. Pascaline : p. 159-176.
Influence de la température d'élevage sur les taux d'ingestion, de croissance et d'efficacité de la croissance brute chez le cilié oligouriche pélagique *Lohmanniella spiralis* Leeg., nourri sur la matière particulaire naturelle, par F. Rassoulzadegan : p. 177-184.
La chlorophylle *a* dans un sédiment estuarien de Bretagne nord, par C. Riaux : p. 185-203. 50 F

Volume 59

- A592 Fascicule 2 - Caractéristiques du plancton de la Méditerranée orientale, par B. Kimor : p. 97-106.
Cycle vital et croissance de l'appendiculaire *Oikopleura longicauda* (Vogt), 1854, par R. Fenaux et G. Gorsky : p. 107-116.
Description d'un traineau destiné à l'échantillonnage quantitatif étagé de la faune suprabenthique néritique, par J.C. Sorbe : p. 117-126.
Contribution à l'étude de la biologie reproductive d'une population naturelle de l'Annélide Polychète *Sabellaria alveolata* (Linné), par Y. Gruet et P. Lassus : p. 127-140.
La croissance d'*Asterias rubens*. I. (Echinodermata Asteroidea) en baie de Douarnenez (Finistère), par M. Guillou : p. 141-154.
Normalisation des symboles pour la représentation et la cartographie des biocénoses benthiques

littorales de Méditerranée, par A. Meinesz, C.F. Boudouresque, C. Falconetti, J.M. Astier, D. Bay, J.J. Blanc, M. Bourcier, F. Cinelli, S. Cirik, G. Cristiani, L. Di Geronimo, G. Giaccone, J.G. Harmelin, L. Laubier, A.Z. Lovric, R. Molinier, J. Soyer et C. Vamvakas : p. 155-172. 50 F

Volume 61

- A611 Fascicule 1 - Les récifs coralliens de l'île de Makatea, archipel des Tuamou, Pacifique central : géomorphologie et répartition des peuplements, par L.F. Montaggioni, G. Richard, C. Gabrie, M. Monteforte, O. Naim, C. Payri et B. Salvat : p. 1-25.
 Cartographie des peuplements benthiques marins de Corse : I. La formation récifale à *Posidonia oceanica* de Saint-Florent, par C.F. Boudouresque, A. Meinesz et J.R. Lefevre : p. 27-38.
 Étude préliminaire de l'épifaune des sédiments meubles de la rade de Brest (Finistère, France) à l'aide d'une caméra vidéo sous-marine, par A. Bourgoïn, M. Guillou et C. Morvan : p. 39-50.
 Origine des sédiments ingérés et durée du transit digestif chez l'oursin spatangide *Echinocardium cordatum* (Pennant) (Echinodermata), par C. de Ridder et M. Jangoux : p. 51-58.
 Recherches sur l'écologie des mollusques bivalves du plateau continental sud-gascogne, par M. Comet : p. 59-74.
 Rôle de la température et de la salinité sur la mue, la métamorphose et la croissance à chaque stade larvaire de *Palaemon serratus* (Pennant) (Palaemonidae, Decapoda, Crustacea), par H. Yagi et J. Ceccaldi : p. 75-93. 50 F

Volume 62

- A621 Fascicule 1 - Dynamique de la population d'*Abra prismatica* (Mollusque, Bivalve) de la baie de Morlaix (Manche occidentale), par J.C. Dauvin : p. 1-12.
 Structure des peuplements méiobenthiques dans le secteur pollué par le rejet en mer de l'égout de Marseille, par M. Keller : p. 13-36.
 La maladie de l'«oursin chauve» : ultrastructure des lésions et caractérisation de leur pigmentation, par Ph. Maes, M. Jangoux et L. Fenaux : p. 37-45.
 Les Bryozoaires littoraux de la ria de Ribadeo, par E.F. Fernandez Pulpeiro : p. 47-68.
 Identification and Systematics of the Tintinnina (Ciliophora) : Evaluation and Suggestions for Improvement, par M. Laval-Peuto and D.C. Brownlee : p. 69-84.
 Eau rouge à *Noctiluca* sur la côte de Provence en juin 1984. Essai d'interprétation dynamique, par J.M. Pérès, P. Laborde, J.C. Romano et Y. de Souza-Lima : p. 85-116.
 Le plancton dans l'upwelling de Cabo Frio (Brésil) : microrépartition spatio-temporelle à une station fixe, par J.L. Valentin, N.M. Lins da Silva, W.M. Monteiro-Ribas, M.A. Mureb, C.T.B.T. Bastos, D.R. Tenembaum, D.L. André, S.A. Jacob et E. Pessotti : p. 117-135. 50 F

Bon de commande

date : _____

Nom (en capitales) : _____

Adresse : _____

Code postal _____ Ville _____

☐ Je désire recevoir un complément d'information sur les publications de l'Institut océanographique

Référence	Titre abrégé	Qté	Prix unitaire	Total
Total :				
Réduction 10 % (*) :				
A régler :				

(*) Si le montant de la commande dépasse 400 F ou si vous êtes libraire

Ce bon de commande est à adresser à :
 Institut océanographique - Service des publications - 195, rue Saint-Jacques - 75005 Paris
 Règlement par chèque bancaire ou postal joint, à l'ordre de l'Institut océanographique

Fourth European Echinoderms Colloquium

London

**The Natural History Museum
9th - 12th April, 1995**



First circular

Fourth European Echinoderms Colloquium

9th - 12th April, 1995

This will be held in London, under the auspices of the Natural History Museum, jointly organized by Andrew B. Smith, the Natural History Museum, Roland Emson, King's College, London, and Andrew Campbell, Queen Marys College, London. It will be a four day meeting, without concurrent sessions, covering all aspects of echinoderm research, but including three thematic half-day sessions. To mark the retirement of Professor David Nichols and the contribution he has made to our knowledge of the echinoderms these will be on Reproductive biology, Structure and function, and Palaeobiology, topics in which he has had a particular interest.

A second circular calling for papers and including registration and booking forms will be sent out in April, 1994.

To receive the next circular please fill in and return the form below to:

Dr. Andrew B. Smith, Department of Palaeontology, the Natural History Museum, London SW7 5BD, U.K.

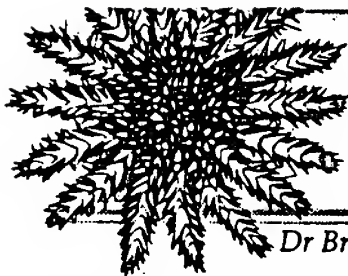
Name..... Title.....

Full postal address.....
.....
.....
.....
.....
.....
.....

Telephone.....

Fax.....

Email.....



COTS COMMS

Dr Brian Lassig and Udo Engelhardt

We've reported on an apparent increase in the number of crown-of-thorns starfish on some reefs off Cairns and further north in the last two issues of COTS COMMS. The increase was based on reports from Reef users through the COTSWATCH Program (see next section). Recent analysis of the information collected through this scheme over the last few years and the results of 7 years of AIMS surveys (see Current COTS) shows that the increase in starfish numbers in parts of the northern GBR is real.

But before the panic button gets pushed, the newspaper headlines typeset and the COTS Program Coordinator besieged by bloodhounds, consider the densities of starfish being reported. During the peak of outbreaks on reefs off Townsville in the late 1980s, the AIMS manta tow surveys recorded averages of 200 to 300 COTS per reef, and around 4 starfish per 2-minute manta tow. The current average densities of starfish being reported on reefs off Cairns and further north are two orders of magnitude lower (i.e. 1/100th of outbreak densities). These are averages based on reefs within the particular Reef Sectors. On some individual reefs (e.g. Michaelmas Cay and Lizard Island) the COTS densities aren't too far from being called localised outbreaks.

We don't know whether or not the increase in starfish numbers represents the early stages of another major outbreak for the GBR. During the previous outbreak episodes there were no substantial monitoring programs in place that could have detected the increases currently being seen, so we don't know if outbreaks start with a bang or a gradual build up in starfish numbers. The only way we will get a clear picture of the dynamics of COTS on the Reef and the initiation of outbreaks is to maintain a close watch on the current situation.

RELAUNCH OF THE COTS - REEF USER SURVEY SCHEME (COTSWATCH)

A new and improved public participation program aimed at getting more Reef users actively involved in reporting COTS sightings was launched in November 1993. The new program continues the evolution of survey schemes that were spawned in 1982. Largely in response to comments made by previous contributors, we decided to introduce some fairly major and hopefully beneficial changes. COTSWATCHERS of the world report!

The survey form used for reporting on starfish sightings has been redesigned, making it more user-

friendly and easier to complete. The number of questions on the form has also been reduced. An illustration of a mature crown-of-thorns starfish now assists Reef users in the positive identification of the species. There is also a warning in relation to the danger posed by the venomous spines of the starfish.

What hasn't changed is the emphasis on reporting 'zero-sightings' as well as actual sightings of starfish. Appropriate management action, i.e. giving permission to attempt local-scale controls, requires knowledge of both the past and present situations at any given reef. Also, our chances of detecting any real increase in the numbers of starfish over time rely very much on long-term records, including reports on both the presence and absence of COTS!

We have also attempted to address some other shortcomings of previous schemes - namely the insufficient feedback given to COTSWATCHERS. In the past, lack of time and resources often prevented us from maintaining an effective two-way flow of information between contributors to the scheme and ourselves. However, this is already changing. The new user survey scheme now provides added incentives to all contributors through a variety of new measures.

COTSWATCHERS will now:

- receive free information (i.e. brochures, booklets) on the latest research into the starfish phenomenon and on the Great Barrier Reef Marine Park in general;
- be acknowledged in *Reef Research* (starting with this issue; see below);
- be invited to attend regular slide presentations and updates on the current status of the starfish on the Reef. The aim is to conduct these presentations every six months in the major regional centres along the north Queensland coast.

Regular contributors to the scheme who provide information for extended periods of time may also receive additional tokens of our appreciation i.e. in the form of research publications, slides and maybe even a video tape (note that this doesn't mean that you'll score more brownie points by reporting more COTS!).

INFORMATION: The Editor,
Reef Research GBRMPA

Reef Research March 1994

SAMS

THE SCOTTISH ASSOCIATION FOR MARINE SCIENCE

Aspects of Marine
Conservation and
Coastal Ecology

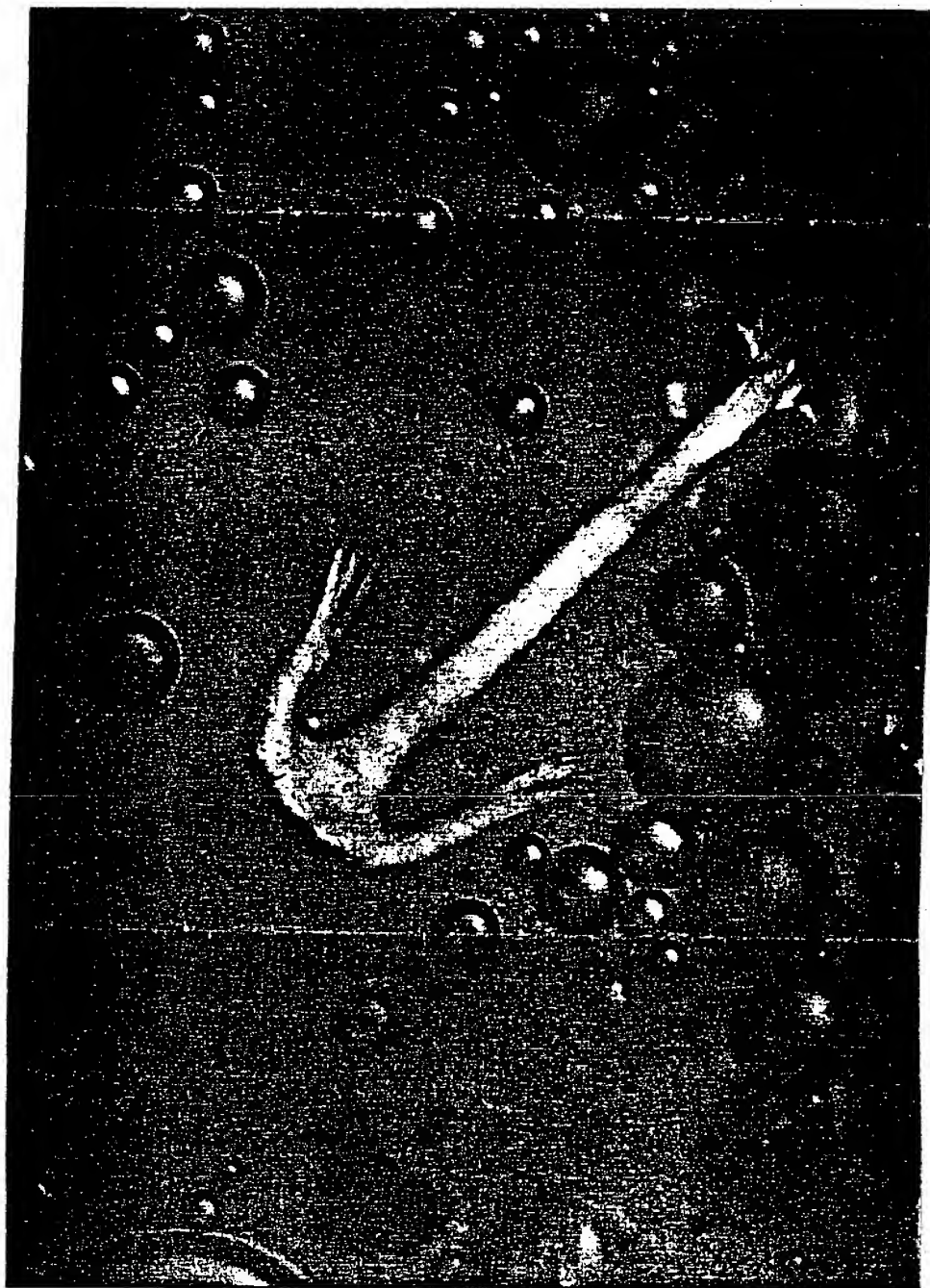
Ras Mohammed
Coral Reefs

Scottish Marine Group

Cyanobacterial
(Blue-Green)
Algal Toxins

Scottish Environmental
Education Council

Postgraduate Studies
in Marine Science at
Scottish Universities



Anchor ossicle from the sea cucumber *Labidoplax digitata*. The anchors are used in locomotion. Photograph. by Dr J. Douglas McKenzie. taken on a Zeiss Axioskop using Nomarski differential interference contrast.

Newsletter 9
March 1994

A B S T R A C T

The monograph represents a review on data, concerning structure, taxonomical distribution, biological activities and functions of unique group of natural products, namely triterpene glycosides of holothurians. Detailed information on biology and biochemistry of these animals is given to demonstrate the place of the triterpene glycosides among functional systems and subsystems of their producers - holothurians. Triterpene glycosides are used as a model for the analysis of evolution of complex adaptation. Structure-function relationship for these compounds are analyzed using so-called holistic or system-theoretical approach of Van-der-Claauw - Dullemeijer. Application of such morphological trends of evolution as aromorphosis, idioadaptations as well as the theories of organogenesis modes and phylembryogeneses to the studies on evolution of triterpene glycosides has been also shown. We suggest to call the approach, dealing with the application of comparative-morphological method to biochemical level as chemical morphology.

CONTENTS

PREFACE

INTRODUCTION

1. BIOLOGY OF SEA CUCUMBERS

1.1. General characteristics

1.1.1. Morphology

1.1.2. Physiology

1.1.3. General chemical composition

1.1.4. Way of life

1.1.5. Feeding

1.1.6. Reproduction

1.1.7. Distribution, role in communities

1.1.8. Enemies.

1.1.9. Economical significance

1.2. Systematics

1.2.1. Systematics: principles and directions

1.2.2. Diagnostic characters of sea cucumbers

1.2.3. System of class

1.3. Phylogeny

1.3.1. Phylogenetics: general consideration

1.3.2. Phylogeny of type Echinodermata

1.3.3. Phylogeny of Holothurioidea

2. BIOCHEMISTRY OF SEA CUCUMBERS

2.1. Some general information on composition of fractions and structures of primary and secondary metabolites of echinoderms.

2.2. Primary metabolites including biopolymers and their precursors from sea cucumbers

2.3. Secondary metabolites from sea cucumbers

3. TAXONOMICAL DISTRIBUTION OF TRITERPENE GLYCOSIDES OF SEA CUCUMBERS

3.1. Order Aspidochirotida

3.1.1. Family Holothuriidae

3.1.2. Family Stichopodidae

3.2. Order Dendrochirotida

3.3. Scratch chemically investigated groups of Holothurioidea

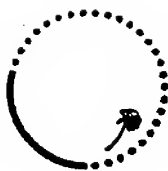
4. TRITERPENE GLYCOSIDES AND SYSTEMATICS OF SEA CUCUMBERS

4.1. General considerations

4.2. Revision of taxonomic status of *Bohadschia graeffei*

- 4.3. On taxonomic status of North Atlantic sea cucumber *Holothuria forskali*
- 4.4. On taxonomic status of North Pacific stichopodids
- 4.5. Other groups
- 4.6. The structure of triterpene glycosides and phylogeny of Holothurioidea
- 4.7. General trends of triterpene glycosides of Holothurioidea evolution
 - 4.7.1. General considerations
 - 4.7.2. Gomological variability and trend in sea cucumbers triterpene glycosides evolution
 - 4.7.3. The correlation between chemical and morphological diversity .
5. BIOLOGICAL ACTIVITIES AND BIOLOGICAL FUNCTIONS OF SEA CUCUMBERS TRITERPENE GLYCOSIDES
 - 5.1. Biological activities of glycosides
 - 5.1.1. Toxic properties of glycosides
 - 5.1.2. Other types of biological activities
 - 5.2. Biological functions of glycosides
 - 5.2.1. Resistance ability of sea cucumbers cell membranes against action of their own triterpene glycosides
 - 5.2.2. Regulation of reproduction - the inner function of sea cucumber glycosides
 - 5.2.3. Internal function of sea cucumber triterpene glycosides
 - 5.3. Some conclusions
6. MORPHOLOGICAL CONCEPTIONS AND APPROACHES TO SEA CUCUMBER TRITERPENE GLYCOSIDES EVOLUTION AND THEIR STRUCTURE-FUNCTION RELATIONSHIPS
 - 6.1. General considerations
 - 6.2. Holistic or system-theoretical approach to description of sea cucumber glycosides structure-function relationships
 - 6.3. Morphological trends in sea cucumber triterpene glycosides evolution
 - 6.3.1. General considerations
 - 6.3.2. The conception of organogenesis modes
 - 6.4. Morphological trends in evolution of biosynthesis of sea cucumber glycosides
 - 6.4.1. Biosynthesis of sea cucumber triterpene glycosides
 - 6.4.2. The theory of phylembryogeneses
 - 6.5. General trends of sea cucumber triterpene glycosides phylogenesis
- CONCLUSIONS. CHEMICAL MORPHOLOGY - A NEW APPROACH TO THE INVESTIGATION OF STRUCTURE-FUNCTION RELATIONSHIPS OF BIOMOLECULES
- INDEX OF LATIN NAMES

Kalinin V. I., Levin V. S., Stonik V. A. The chemical morphology: Triterpene glycosides of sea cucumbers (Holothurioidea, Echinodermata)/ Pacific Institute of Bioorganic Chemistry of the Far East Branch of the Russian Academy of Sciences; Kamchatka Department of the Pacific



MARINE RESOURCES PROGRAMME
INFORMATION SECTION
FISHERIES INFORMATION PROJECT

SOUTH PACIFIC COMMISSION
PO BOX D5 - NOUMEA CEDEX
NEW CALEDONIA



BECHE-DE-MER

INFORMATION BULLETIN

Number 5 — August 1993

Editor: Chantal Conand, Université de la Réunion, Lab. de Biologie Marine, 97715 Saint-Denis Messag. Cedex 9, La Réunion
Production: Jean-Paul Gaudechoux, Fisheries Information Officer, SPC, PO Box D5, Noumea, New Caledonia

NOTE FROM THE EDITOR

Since the last issue, new members have joined our Special Interest Group. They are welcome and invited to send comments, information and articles to the next bulletins which will be published now, we hope, twice a year. Thanks to those who have contributed to this issue.

The first section of this issue contains useful information on our main areas of interest, i.e. markets and fisheries, the biology and ecology of sea-cucumbers, and management. Several articles present recent data on world markets, marketing and local fisheries in the tropical Pacific and the Indian Ocean. According to world market statistics, beche-de-mer imports have peaked in 1988, but recent figures are needed to interpret the 1989 decline.

Within the Pacific region, fishery statistics present contrasting trends. In Papua New Guinea, production appears stable. In Solomon Islands, production first increased in 1986 when it passed 100 t; in 1991 it peaked at 662 t. The mean value per kg has not changed much since 1988. In Fiji, production has declined since 1989, but the mean value per kg for exported products has doubled since that time. The decline is probably related to the population decline described by Tim Adams in his article.

Most of the recent progress made on the biology and ecology of holothurians is presented in the section on publications. The reply by Lyle Vail to the request for information on spawning provides some interesting data. If you have made similar observations, please provide them, and we will publish them in the next issue.

Chantal Conand

Inside this issue

Marketing of beche-de-mer
by William S. Sommerville Page 2

Recent evolution of Hong Kong and
Singapore sea cucumber markets
by Chantal Conand Page 4

Statistics on beche-de-mer produc-
tion Page 9

Regional Sea Cucumber Meeting
by Tim Adams Page 13

Management of beche-de-mer (sea
cucumber) Fisheries
by Tim Adams Page 15

Beche-de-mer correspondence
Page 23

Beche-de-mer Abstracts, Publica-
tions, Workshops and Meetings
Page 25

List of beche-de-mer buyers
Page 29

Welcome to new members
Page 31



NEW BOOK INFORMATION

Genetics and Evolution of Aquatic Organisms

Edited by A Beaumont, School of Ocean Sciences,
University College of North Wales, UK

Two thirds of the Earth is covered by water; aquatic organisms therefore play a vital role in the Earth's ecosystem. This single volume is based on the selected proceedings of an international conference held at the University of Wales, Bangor, UK on 10-16 September 1992. Review articles and research papers from a truly international list of contributors provide a unique combination of background information together with current directions of research in the evolution and genetics of organisms in aquatic habitats.

The wide range of topics discussed include genetic differentiation at population, species and higher taxonomic levels, heterosis and adaptation, genetics and evolution of asexually reproducing organisms, genetics and pollution, and genetics in aquaculture. Both traditional karyology and allozyme approaches are covered; however, there is a strong focus on the latest developments in DNA technology and their power to address problems in the field throughout the book.

The book is organized into themes, each introduced by keynote papers. Keynote authors include G R Carvalho (UK), E M Gosling (Ireland), H Hummel (Netherlands), A Meyer (USA) T Patamello (Italy) D O F Skibinski (UK) C Thiriot-Quievreux (France) and E Zouros (Greece and Canada). All papers in this volume have been tightly edited to provide a clear, coherent, state-of-the-art review.



Key Benefits

- * brings a wide range of information together in one place
- * information presented in a manner suitable for both students and researchers

Contents: Preface. Speciation and wide scale genetic differentiation. Gene flow and population structure. Heterozygosity, heterosis and adaptation. DNA technology and genetics of aquatic invertebrates. DNA technology and phylogeny of fish. Genetics of aquatic clonal organisms. Chromosomal genetics. Genetics and pollution. Genetics and aquaculture.

March 1994: 234x156: 560pp, 109 line illus, 40 halftone illus
Hardback: 0-412-49370-5: £69.00



CHAPMAN & HALL



2-6 Boundary Row, London, SE1 8HN, U.K. Telephone: 071-865 0066 Fax: 071-522 9623
London • Glasgow • New York • Tokyo • Melbourne • Madras

ORDER COUPON

Send to: Direct Response Supervisor, Chapman & Hall, Cheriton House, North Way, Andover, Hants, SP10 5BE
UK orders: Tel: 0264 342923 Fax: 0264 364418 **Overseas orders:** Tel: 44 +264 342830 Fax: 44 +264 342761
If ordering in the USA, please contact: Chapman & Hall, One Penn Plaza, 41st Floor, New York, NY 10119, USA
Tel: USA + 212 564 1060 **Fax:** USA + 212 564 1505
 Also available from your local bookseller.
Please send me:

Price

Refund policy: We will promptly refund payment for books returned within 30 days after receipt, provided they are in a saleable condition.

- ☐ I enclose a cheque/International Money Order/Eurocheque for _____ made payable to *Chapman & Hall*
- ☐ Please invoice me/my company (books will not be sent before we receive payment)
- ☐ Please charge £/\$ _____ to my:

Visa\Access\Mastercard\American Express\Diners Club account

[illegible]

Expiry Date _____ Signature _____

If name and address on your credit card differ from delivery address, please state

Name _____

Position/Dept _____

Organisation _____

Address _____

Postcode _____

Telephone _____ Fax _____

If registered for VAT/local sales tax, please provide your number (to comply with EC regulations) _____

Date _____ Signature _____

Type of Business _____ Name of Librarian/Information Officer _____

UK: Chapman & Hall, 2-6 Boundary Row, London, SE1 8HN, England. Germany: Chapman & Hall GmbH, Pappelallee 3, 69469 Weinheim, Germany. TEL: 49 62 01 60 60
FAX: 49 62 01 63 34. Japan: International Thomson Publishing Japan, Kyowa Building, 3F, 2-2-1 Hirakawacho, Chiyoda-ku, Tokyo 102, Japan.
Singapore: International Thomson Publishing, 221 Henderson Road, 05-10, Henderson Building; Singapore 0315. Australia: Chapman & Hall Australia, Thomas Nelson
Australia, 102 Dodds Street, South Melbourne, Victoria 3205, Australia. FAX: 3 685 4199. TEL: 3 685 4111. Australia/New Zealand: D A Books, P O Box 163, Mitchem,
Victoria 3132, Australia. India: R Seshadri, Chapman & Hall, 32 Second Main Rd, CIT East Madras, 600 035, India. FAX: 91 44 459 295. TEL: 91 44 458 246.

Goods and services are supplied to our terms of sale and supply. Copies of our terms are available on request.

JLM 0394

(Professor John) Swan Poem

Professor John Swan commemorated his retirement from chair of the Crown-of-Thorns Starfish Research Committee (COTSREC) by bequeathing the following literary legacy:

The Age of Reason and *Acanthaster planci*

Under the December moon, more often under sun,
Chance encounters during spawning, there are almost none.
The female egg, as ever was the case,
Attracts the male sperm to her embrace.
And chemotaxis, as the name implies,
Makes no distinction 'twixt the foolish and the wise.
And what is more, the oft-observed communal aggregation,
Ensures for all a most successful starfish propagation.

Gastrula! Bipinnaria! Brachiolaria!
Fourteen days of buoyant freedom, sometimes twenty-eight,
A pea-soup diet, *Dumaliella*, presently their fate.
Then down they go! To bed with crustose algae and
Lithothamnium pseudosorum.
Now watch each starfish grow from its remarkable
primordium.

Then come the fish, the crabs, the worms
Their brothers, sisters, cousins,
That finally reduce our *Acanthaster* population
From the millions to the dozens.

A few more months and then, the promised land!
Where milk and honey flow from coral strand.
White scars appear on branching staghorn corals,
And far away - the muted roar of academic quarrels.

"It's predator removal"; "Heavy rainfall after drought";
"It's the farmers"; "It's El Nino"; "Larval transport without
doubt".

It seems the reef is "under threat",
And who to blame? - the Managers, I'll bet.

But Johnson points to H. McCallum's optimistic simulations:
"The patterns of the starfish plagues in reef sub-populations,
Are cyclical, or quite chaotic, numbers high or low,
Depending on the larval pulses, water movement, ebb and
flow."

The oceans are resilient, their systems are robust,
Life forms adapt, evolve and flourish; corals will adjust.
So shoot the foxes, feral cats, the pigs, the goats and rabbits,
But learn to love the crown-of-thorns; accept its natural
habits.

Source: Reef Research Vol. 3(1), March 1993



Antarctica - Continuing Trend Toward More Science Personnel

Australia's 1992-93 Antarctic science season, the 46th of Australia's modern Antarctic program, got under way on 17 October with the departure from Hobart of *Aurora Australia*. This summer saw a total of 185 scientific personnel undertaking research in Antarctic and subantarctic regions, nearly three times the number of researchers in the mid-1980s.

Major research programs included:

- deep ice core drilling at Law Dome, inland from Casey, analysing cores to provide records of past climatic conditions;
- research into the interaction between ice and atmosphere to determine the role of sea ice in global climate change;
- investigations of the UV radiation climate over the Southern Ocean south of Australia and the response of phytoplankton to UV radiation exposure;
- upper atmospheric and geological studies; and
- two major inter-disciplinary marine science voyages.

Two marine science research cruises saw the most extensive use yet of *Aurora Australis* as a scientific research vessel. The first concentrated on krill and zooplankton distribution, with associated biological, oceanographic and geological studies, while an autumn ice-edge voyage examined the oceanographic structure of the water masses between Hobart and the Antarctic continental shelf. This second cruise was part of the World Oceanographic Circulation Experiment (WOCE), investigating ocean currents' current and potential role in driving climate.

Much of this season's effort went into improving Australia's already high standards of environmental management. It included continuing removal of rubbish from disused tips and completion of removal of the former Casey station.

The *Aurora Australia* was supported by the supply vessel *Icebird*, in its ninth season with the Australian Antarctic Program.

Source: ANARE News Spring/Summer 1992-93

Title	ISBN	Price	Quantity	Total
THE SEA				
MARINELIFE IDENTIFICATION				
Guide to Inshore Marine Life	limpback 0 907151 34 5	12.95		
A Field Guide to the Shallow-water Echinoderms of the British Isles	limpback 0 907151 88 4	15.95		

Immel Publishing 1993 List & Order Form

To obtain copies of Immel books:

INTERNATIONAL: Orders from non-EC countries should be directed to:
Immel Publishing Ltd 20 Berkeley Street, Berkeley Square, London W1X 5AE
Tel: 071 491 1799 Fax: 071 493 5524

EC COUNTRIES: Orders from EC countries should be directed to our distributor:
Biblos PDS Ltd Star Road, Partridge Green, West Sussex RH13 8LD
Tel: (0403) 710851 (orders) Tel: (0403) 710971 (enquiries) Fax: (0403) 711143

Name _____
Company _____
Address _____
Tel _____ Fax _____

ATTENTION ARTHRITIS SUFFERERS!

Sea Care
Help Ease Joint
Discomfort... Naturally!

This newly introduced, All-Natural protein food product derived from a variety of Sea Cucumbers (Beche-de-Mer) is from Australia's Great Barrier Reef and now available from Nutrition Headquarters!

Registered as a Therapeutic Medicinal (AUST. P. 18678)

...as heard about on Radio Talk Shows from coast to coast!

• Imported Exclusively From Australia •

SPECIAL INTRO PRICE!

500 MG.
60 Capsules- **\$33.95** reg. \$38.95

ITEM# B27283

ECHINODERMS OF THE ROVINJ AREA

Center for Marine Research, "Rudjer Bošković" Institute,
52210 Rovinj, Croatia

CRINOIDEA

Antedon mediterranea (Lamarck, 1816)

HOLOTHUROIDEA

Holothuria tubulosa Gmelin, 1788
Holothuria helleri Marenzeller, 1878
Holothuria polii Delle Chiaje, 1823
Holothuria impatiens (Forsk., 1775)
Holothuria forskali Delle Chiaje, 1823
Eostichopus regalis Cuvier, 1817
Ocnus planci (Brandt, 1835)
Stereoderma kirschbergi (Heller, 1868)
Leptopentacta elongata (Düben and Koren, 1844)
Leptopentacta tergestina (M. Sars, 1857)
Thyone fusus mediterranea Madsen, 1941
Thyone cherbonnieri Reys, 1960
Havelockia inermis (Heller, 1868)
Pseudothyone sculponea Cherbonnier, 1958
Phyllophorus urna Grube, 1840
Neocucumis marioni (Marenzeller, 1878)
Leptosynapta inhaerens (O.F. Müller, 1776)
Labidoplax digitata (Montagu, 1815)

ASTEROIDEA

Astropecten aranciatus (Linnaeus, 1758)
Astropecten irregularis pentacanthus (Delle Chiaje, 1825)
Astropecten bispinosus (Otto, 1823)
Astropecten platyacanthus (Philippi, 1837)
Astropecten spinulosus (Philippi, 1837)
Asterina gibbosa (Pennant, 1777)
Asterina phylactica Emson and Crump, 1979
Anseropoda placenta (Pennant, 1777)
Echinaster sepositus (Retzius, 1783)
Coscinasterias tenuispina (Lamarck, 1816)
Marthasterias glacialis (Linnaeus, 1758)

OPHIUROIDEA

Ophiomyxa pentagona (Lamarck, 1816)
Amphiura chiajei Forbes, 1843
Amphiura mediterranea Lyman, 1882
Amphiura cherbonnieri Guille, 1972
Amphiura filiformis (O.F. Müller, 1776)
Amphipholis squamata (Delle Chiaje, 1828)
Ophiothrix fragilis (Abildgaard, 1789)
Ophiothrix quinquemaculata (Delle Chiaje, 1828)
Ophiopsila aranea Forbes, 1843
Ophioderma longicaudum (Retzius, 1805)
Ophioconis forbesi (Heller, 1863)
Ophiura albida Forbes, 1839
Ophiura grubei Heller, 1863
Ophiura ophiura (Linnaeus, 1758)

ECHINOIDEA

Arbacia lixula (Linnaeus, 1758)
Sphaerechinus granularis (Lamarck, 1816)
Echinus acutus Lamarck, 1816
Echinus melo Lamarck, 1816
Psammechinus microtuberculatus (Blainville, 1825)
Paracentrotus lividus (Lamarck, 1816)
Echinocyamus pusillus (O.F. Müller, 1776)
Spatangus purpureus (O.F. Müller, 1776)
Echinocardium cordatum (Pennant, 1777)
Schizaster canaliferus (Lamarck, 1816)
Brissopsis lyrifera (Forbes, 1841)

contributed by D. Zavodnik

Howard Barraclough Fell, 1917-1994

Dr. H. Barraclough ("Barry") Fell died of heart failure on 21 April 1994, in San Diego, California. This was a sudden end to an extraordinary career that touched on many branches of science, a career that illuminated the lives of legions of people around the world.

Barry was born in England on June 6, 1917, and resided in New Zealand from 1921 to 1938. After completing an M.Sc. degree at Victoria University College, Wellington, New Zealand in 1938, Barry traveled to the University of Edinburgh, Scotland for his Ph.D. research, which he completed in 1941. From 1941 to 1946 he served with the British Army, and he was demobilised in 1946 with the rank of Major. He returned to New Zealand and joined the faculty of Victoria University College, where he was Senior Lecturer in Zoology from 1946 to 1957 and Associate Professor of Zoology from 1957 to 1964. Edinburgh University awarded him a D.Sc. degree in 1955. In March, 1964, Barry took up an appointment as Curator of Invertebrate Zoology, later Professor of Invertebrate Zoology, at Harvard University's Museum of Comparative Zoology. At the M.C.Z. he was the last in a long line of distinguished students of the echinoderms (L. and A. Agassiz, Lyman, H.L. Clark, Deichmann...). He remained at Harvard until his retirement in 1979, when he and his wife Rene moved to San Diego, California.

He became a Fellow of the Royal Society of New Zealand in 1960, and he was awarded the Royal Society's Hector Research Medal (1959) and Hutton Memorial Medal (1962). He was a Fellow of the American Academy of Arts and Sciences (1964).

His career in science comprised approximately 3 phases. From 1940 to the early 1970's, he was one of the world's leading echinoderm specialists. From 1966 to the early 1970's he became involved in studying distribution patterns of fossil invertebrates. Then, an interest in epigraphy (ancient writings, usually on stone) gradually evolved from an avocation of many years' standing to a full-time late career which captured Barry's interest for the last 25 years of his life. Barry founded the Epigraphic Society in 1974; today, 20 years on, the Society is flourishing, with world-wide membership. His later work, on early history of the Polynesians, on early migrations of man to North America, and on epigraphy in general, resulted in prolific publications, including three very popular books. Here, again, Barry stimulated a fever of enquiry into this intriguing field of research.

Barry's research on the Echinodermata resulted in more than 100 publications, many of these being original works of great importance. Several of his papers, on embryology, on brittlestar classification, on evolution of major groups, have become classics that are constantly cited today. He vigorously sought answers to larger questions, and never hesitated to step into controversial issues, usually providing new and unique perspectives. There is no doubt that, during the period 1950-1970, Barry attracted more students to the study of echinoderms than any

of his contemporaries.

I feel greatly privileged to have been a long-time friend and colleague of Barry Fell's, and I am always grateful to have been a graduate student under him. He was a superb teacher and lecturer; as undergraduate students, we were always impressed by the clarity and precision of his lectures in advanced vertebrate zoology and invertebrate zoology, and at the graduate level, he dazzled us with his expositions on zoogeography and evolution. He guided his graduate students with care and compassion, and we were always delighted to be sounding boards for the avalanches of new ideas that he produced.

Barry was a polymath. He had a broad and deep knowledge of many aspects of science and the arts. He was an authority on astronomy and numismatics, and he was an extraordinary linguist, being thoroughly familiar with many languages, ancient and modern.

Barry is survived by his wife Rene, sons Roger and Julian, daughter Veronica, and three grandchildren.

David L. Pawson